Arris and Gale Lecture

ON

THE INFLUENCE OF THE ARBOREAL HABIT IN THE EVOLUTION OF THE REPRODUCTIVE SYSTEM.

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MR. PRESIDENT, LADIES, AND GENTLEMEN,—The influence of environment upon the structure and organisation of animals is a matter upon which nowadays everybody is well informed. Like so many of the ideas popularised from the work of Darwin, this factor of evolution has tended to become condensed into words and phrases which often hinder, rather than help, the progress of new thought and further research upon the subject. In 1846 when, as newly appointed professor, John Goodsir delivered his first opening address, he chose for his subject "The Progress of Anatomy." "There is nothing," he told his audience on that occasion, "which has more retarded science and philosophy, and the kindred subjects on which human reason has been employed, than the introduction of terms with conventional meanings. Men come at last to defend the terms, as if they were the truth, and to mistake an artificial shadow for the substance required." Goodsir's warning was doubtless needed in 1846; but its need was very much the greater during the upheaval of the next few decades; and to-day no better text could be taken by any man embarking upon a career of teaching others.

THE ARBOREAL HABIT AND EVOLUTION.

That habits and surroundings produce their effects in alteration of animal structure is perfectly obvious. The sum total of the outward appearance of an animal tells very truly, as a rule, what sort of life the animal leads and amidst what surroundings it leads it. But it is when we go beyond the mere outward appearance of the animal and examine the more minute details of its separate systems and organs that the wonder of adaptation is forced upon us, and the futility of any catch phrase to sum up this wonderful influence becomes apparent.

If we turn to Man and examine his special peculiarities and compare them with those of his nearest neighbours, and these in turn with those of their more remote kinsfolk, we see a sequence of modifications impressed upon the plastic animal body by life habit and environment; and if we were to ask what special life habit has been at work to produce the distinct configuration of the human body, we should probably be told by most people that it was the assumption of the orthograde posture—the habit of standing and walking upright. No doubt this assumption of the upright posture has done much in putting the finishing touches upon the evolution of the human stock; but we must be careful to give it no more than its real value. Long before the fashion of walking upright had been even foreshadowed in the crouching gait of the half-finished product, a potent factor was at work producing those changes which ultimately permitted, and culminated in, the erect carriage. This factor which paved the way, and to which most of the general changes of human and primate bodily conformation are due, was undoubtedly the arboreal habit—the habit of climbing and living up trees, instead of dwelling upon the ground beneath.

We are apt to lay too much stress upon Man's descent from the branches. It was not coming down the tree that was so important in the evolution of the human stock; it was the climbing up, the first step towards the freedom of the branches, that counted in the progress of the mammalian stock from which Man has sprung. In brief manner it might be said that this line of mammalian development could be summed up in the saying that some small and humble Insectivore—probably not very unlike our modern Tree Shrew—climbed a tree, lived and evolved among its branches, and, after long ages, walked down to the earth again in the guise of the highest of the Primates.

If the influence of the arboreal habit is not always obvious when we regard only the changes in the general bodily conformation of those Mammals which are upon the line of human evolution, it is, nevertheless, very clearly indicated when we turn to the details of change in separate systems and organs. With regard to the reproductive system, with which this paper is especially concerned, it seems to me that we can never understand the evolution of this system unless we appreciate the necessity for change of habit, and for adaptation of structure, imposed by maternity among the branches.

This, then, is the scope of my lecture—the study of those modifications brought about in the reproductive system by arboreal life, and this especially among those Mammals which are upon the line of the evolution of Man. It is when we attempt to define what Mammals are here considered to be landmarks on the path along which the human stock has evolved that difficulty is encountered. This difficulty I propose to overcome in a somewhat dogmatic manner by appealing to the type of external genitalia as the criterion by which a Mammal is regarded as being upon the line of the human stock or no.

TYPES OF MAMMALIAN EXTERNAL GENITALIA.

In the Arris and Gale lectures which I had the privilege of delivering last year,[1] I discussed this question and arrived at the conclusion that there were two main types of mammalian external genitalia, and these two types I labelled for the purpose of the moment, and purely for convenience, as Type A and Type B. Perhaps it is justifiable now, as a mere matter of temporary expediency, to give more convenient names to these two types; and I propose to designate Type A as Cloacaexplicata, and Type B as Cloacaimplicata. This tentative nomenclature is proposed as indicating the main features of cloacal evolution which takes place in these two types; for in Type A the cloaca is obliterated during development by eversion, while in Type B the cloaca is obliterated by the infolding of the cloacal margins. I will go no further into this question now than to say that Type A is that which is characteristic of Man, and with Man an assemblage of lower mammalian forms. It is therefore those lower animals of which the external genitalia conform to this Type A that are considered here as being upon the line along which Man has evolved.

[1] THE LANCET, April 11th and 18th, 1914.

In my previous lectures I did not attempt to give any detailed list of the individual mammalian forms which fall into this line. Any classification furnished now must of necessity be incomplete, for until the developmental phases of the external genitalia of any particular Mammal are studied some uncertainty may be entertained concerning its true position. Nevertheless, sufficient material has already been examined to enable the general outline to be perceived, and to detect the presence of Mammals having this Type (A) of external genitalia in retrograde series from Man downwards.

Tracing this type towards its parent stock we are led to that primitive and central group of Eutherian Mammals, the Insectivora. It was Huxley's opinion as a young man that a primitive member of this group represented as nearly as possible the picture of the root stock of the Eutherian Mammals, and after another 30 years of work this view, put forward in his youth, was still more strongly adhered to. A more recent pronouncement of the same idea is that of Matthew (1909), who has declared that "the Insectivora represent more nearly than any other order the central stock from which the various groups of placental Mammals have descended."

TYPES OF EXTERNAL GENITALIA IN INSECTIVORA.

One interesting fact that has emerged from the present investigation into the method of formation of the external genitalia is that within the limits of this group are comprised not only animals whose cloacal closure is carried out as in Type A and as in Type B, but several forms in which the cloaca remains permanent throughout life. Here, then, is evidence of a primitive and generalised central position of the Insectivora such as was believed in by Huxley. The Insectivora form the basal meeting point of the Cloacaexplicata and Cloacaimplicata, and at this meeting point is found the simple cloacal Eutherian Mammal from which presumably both were derived. We might, if this matter of tentative nomenclature and classification has not already gone far enough, say that the members of the great Order of Insectivora might be divided into three groups—the most primitive group having the cloaca as a permanent structure (Cloacaperta), the second with outfolded cloaca (Cloacaexplicata), and the third with infolded cloaca (Cloacaimplicata).

There are several species of inconspicuous and little-studied Shrews in which the cloaca persists in as perfect a form as that seen in the Reptile or Bird. I think that these small cloacal Eutherians have not had sufficient importance assigned to them in the study of the phylogeny of the Mammals. There appears a tendency to assume that the cloaca of these animals is not a true one, or is a mere adaptation in some cases to an aquatic habit. By no means all these cloacal forms are aquatic, and there seems to me no doubt that the cloaca of the Insectivora is in every way as true a cloaca as that of the Reptiles or of *Ornithorhynchus* or *Echidna*. So far I have examined the microscopic details of *Blarina meridensis* from Venezuela and *Crocidura bottigi* from Abyssinia, and there remains a very large number of other forms still to be examined.

Again, a large number of species of Insectivora pass from the cloacal stage to the non-cloacal during embryonic development in the manner that I have described as typical of the Cloacaimplicata, and in this way mark the road which the Rodentia and Ungulata follow in their development. Some forms, such as the common mole (*Talpa europea*), have carried this method of development to an extraordinary degree, so that the males and females come to possess an outward sexual appearance that is identical; and again in this they are the pioneers of a development that is also displayed in Rodentia (*Capromys pilorides*), and even Carnivora (*Hyæna crocuta*). But of more interest to us in the present study is the fact that some Insectivora—or animals usually classed among the Insectivora—close the cloaca during embryonic development in the manner typical of the Cloacaexplicata, typical of the Primates and of Man.

The Tree Shrews.

These interesting animals are those known as the Tree Shrews, and called by the Malays "*Tupai*," a name which they share with the squirrels, that are true Rodents. They are of more than a dozen species, all inhabiting the Indo-Malayan region, and all possessing that rough general likeness to squirrels which has led to this very simple case of convergence being foolishly magnified into an example of protective mimicry on the part of the Insectivore. The *Tupaias* are active little animals, hunting their insect food amongst jungle from sea-level to the tops of mountains 5000 feet high. Like most arboreal forms, they have so far emancipated the fore limb from the duties of mere progression as to use their hands for conveying food to their mouths, and most have the feathered tail which, like that of the squirrels, aids them in their arboreal activities.

They have been assigned to rather different zoological positions by systematic zoologists. Their affinities are so varied that now one character and now another has been taken as indicating near kinship with several different types. From the rest of the Insectivora they and the *Macroscelididæ* are distinguished by possessing a cæcum; and these two groups are now, as a rule, combined as the *Menotyphla* (Lecke, 1884). From the *Macroscelididæ* (Cape Jumping Shrews) they differ anatomically in several characters, one of the most important being that whereas the orbits of the Jumping Shrews are not completely encircled by bone, those of the Tree Shrews approach the Lemurs and higher orders in this respect and have an entire bony ring.

It is not alone in the form of its external genitalia that the *Tupaias* show conditions unlike those seen in other insectivores and approximate those found in other and higher orders. In many features of the skull and the brain they are very much advanced from the moles and shrews and their allies; and in these features as well as in some of their dental characters they show definite affinities not only with the Lemurs, but also with Galeopithecus and the Bats.

But there is one point of the greatest interest in the conformation of the external genitalia of the male *Tupaia*; the testes, unlike those of the Insectivora as a class, are permanently descended into a scrotum, but this scrotum is situated unusually far forward, so that the testes lie to the sides of the penis rather than behind it—a condition that can only be described as intermediate between that seen in the Marsupials and that typical of the Eutherian Mammals.

THE DEVELOPMENT OF THE PELVIS.

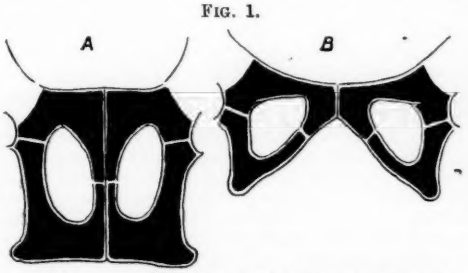
One fact has become more and more striking to me as I have attempted to follow mammalian affinities by the criterion of the external genitalia, and it is that the animals which follow the type of

the Cloacaexplicata are essentially tree-climbing creatures. In attempting to unravel this story we are led by easy stages through the Lemurs to *Tupaia*, a typically arboreal animal; but we also find ranged in this series other animals which, though thorough tree climbers, seem to be linked by no easy stages with the stock we are considering.

Although in the finding of Primate linkages in steady sequence back into the Insectivora one may feel tolerably certain that one is dealing with true phylogenetic affinities, some doubts and some questions must arise when such aberrant animals as certain of the Edentates fall into the same group. But even should I suggest that, judged by their external genitalia alone, the Sloths were allied to the Primate stock, I should be going no further than others have gone by using altogether different criteria. Still, in the face of the possibility of this being a case of convergence due to the common arboreal nature of the two sets of animals, a great many questions must be asked and answered before we make any suggestion as to the zoological affinities of certain Edentates and Primates from the study of their genitalia. Is it possible that the arboreal habit can in itself create, or alter, a special type of external genitalia such as I have described under the name of Cloacaexplicata? I believe that the answer to this question may be attempted, not by the study of the external genitalia in themselves, but rather from a review of those general pelvic conditions which are found in association with the different types of external genitalia.

The bony framework of the pelvic cavity varies enormously in its general architecture among the different mammalian orders, and in some ways this variation appears to be haphazard and to bear but little relation to accepted zoological affinities. We may assume that the most primitive of the Mammals possessed a pelvic girdle akin to that seen in Sphenodon and in the imbricate reptiles; indeed,

FIG. 1.



Primitive mammalian type of pelvis (A) contrasted with human type (B).

such a pelvic girdle persists very perfectly in the existing Monotremes. In such a pelvis two elements, the pubis and the ischium, meet ventrally, forming an ischio-pubic symphysis. (See Fig. 1, A.) This form of pelvis, in which there is an ischiatic as well as a pubic symphysis, is found with various modifications in Ungulates, in Rodents, in most Marsupials, in most Carnivores, and in some of the Insectivora. The ventral wall of the bony pelvis is long in all these animals, and this factor in itself produces some important characteristics of the reproductive system. The female genital tract between the pelvic uterus and the post-ischiatic vulva must be long, and the copulatory organ of the male must be of proportionate length. These changes will be referred to again, but we might instance here the long female vaginal and urogenital sinus segment, and the elongated copulatory organ in the male associated with the elongated symphysial area of the typical Ungulate.

If we turn at once to the human pelvis the outstanding fact is that the ischia have ceased to meet in the middle line, and with their splaying aside only a comparatively small portion of the pubis itself enters into the formation of the symphysis. (See Fig. 1, B.) Here the ventral wall of the pelvis has, as it were, been split open from its caudal end, and the ischia and also a part of the pubis have been thrust aside. With this shortening of the ventral wall of the pelvis the female genital tract has become very considerably shortened; the urogenital sinus is entirely lacking, and the copulatory organ of the male is reduced in harmony.

Influence of the Arboreal Habit on the Pelvis.

All sorts of intermediate stages exist between the partial pubic symphysis of Man and the complete ischio-pubic symphysis of the Ungulates and Rodents. We have been accustomed to regard the pelvis of Man as the typical orthograde pelvis—the outcome of the erect posture; but I would rather look upon it as the perfected tree-climbing pelvis—the pelvis that has been evolved by the arboreal habit. If in respect to symphysial development we try to match the human pelvis with any example taken from the lower Mammals we shall find it paralleled and even surpassed in the Sloths.

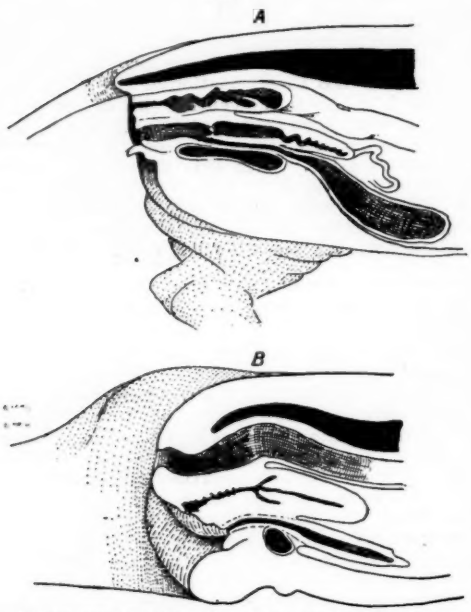
Within the limits of the Primate series the evolution of the human type of pelvis is particularly well seen, a pure pubic symphysis (in which the pubis only enters and to a varying degree) is present in all arboreal types, but in such pronograde forms as *Cynocephalus* and all the dog-like baboons there is a very complete return to the ischio-pubic type of symphysis. A striking contrast in the study of adaptations as opposed to status in zoological classifications is seen in the "open" pelvis of the arboreal *Lemur varia* and the "closed" pelvis of the pronograde *Cynocephalus anubis*. Among the Rodents, the Squirrels exhibit a more open type of pelvis than do their more terrestrial relations, and the semi-arboreal Felines have made a distinct start in the same direction.

Although there are some striking exceptions in the general application of any theory, I believe that it is, on the whole, the altered poise of the body upon the hind limbs that occasions this variation in the development of the symphysis. This alteration of poise is, for the most part, the outcome of the habit of climbing as opposed to mere pronograde four-footed progression upon the level surface of the earth. As a general rule we may say that where the hind limbs bear the weight of the body in the pronograde position there tends to be a complete ischio-pubic symphysis; where the hind limbs bear the weight of the body in the modified position of tree-climbing there tends to be a reduction of the symphysis, culminating in an abbreviated pubic symphysis; and where the hind limbs take no share whatever in supporting the weight of the animal the symphysis tends to be wanting altogether.

We may therefore say that it is, at any rate, a possibility that the arboreal habit has influenced the extent of development of the ventral junction of the bones of the pelvic girdle; that it has tended to bring about a shortening of the area of contact and to limit this area to a portion of the pubis only. In this way a shortening of the female genital tract has been effected, and hand in hand

with this abbreviation a corresponding reduction of the male copulatory organ has taken place. (See Fig. 2, A and B).

FIG. 2



Median sections of the pelvis of (A) a full-term female pig embryo and (B) a full-term female human embryo. Note the apparent outfolding of the female genital tract in (B) where the symphysial area is reduced.

The Pelvis and the Type of External Genitalia.

But I suspect that the splaying out of the ventral portion of the pelvis has done more than this, and that it has, in some measure, influenced the type of external genitalia just as it has modified the type of the lower segment of the internal genitalia of the female by reducing and finally suppressing the long chamber which is common both to the urinary and the reproductive systems.

The fate of the Mammalian cloaca is bound up with the modifications of that portion of the body upon which it is primarily situated, and in the early embryo the cloacal site involves that area in which the ventral union of the pelvic elements ultimately takes place. It is therefore not unlikely that the evolution of the cloaca will in some measure be modified by the extent of this ventral union. There is certainly very definite evidence to show that with the opening out of the symphysis the cloaca tends to be outfolded (type of Cloacaexplicata) in the wide space left between the diverging ischiopubic rami, while with the complete closing up of the symphysis the cloaca tends to be infolded (type of Cloacaimplicata) behind the united ischiatic rami.

In this way it is possible that the arboreal Sloths merely show a convergence towards a Primate condition, and that type Cloacaexplicata may (in such cases) be the result of symphysial modifications produced by the arboreal habit. We shall see later that in several other features of their reproductive systems the Sloths approach the Primate condition, but in these other features also we may see the influence of the common arboreal habit as a rival to the claims of real zoological affinity.

TRANSITIONS FROM TERRESTRIAL TO ARBOREAL LIFE.

Apart altogether from these modifications which may be induced by mere bodily poise, and the discussion of which must be left for the present in a rather problematical stage, there are others impressed upon the reproductive system by the stern realities of the arboreal life. In order to follow these modifications we may picture a primitive Eutherian Mammal, situated right at the base of the Cloacaexplicata, and trace the influence of the arboreal habit upon its general reproductive activities. Such a hypothetical animal is perhaps most nearly represented by those fossil remains of Shrews which occur in the Oligocene of North America and Europe, or going still further back to the Insectivora primitiva of Osborn, which, including the Stylacodontidæ, are as old as the Jurassic.

Like modern Shrews this animal, while hunting for its insect prey upon the ground, would nevertheless show an extraordinary activity, and a highly developed power of climbing, such, for instance, as is often manifested by *Sorex minutus*. We must now imagine it becoming the pioneer of the route which *Tupaia* has followed and adopting the habit of ascending trees in search of its insect food. Such transitions from terrestrial to arboreal searches for insects are seen, of course, very beautifully in other orders, such as Reptilia and Amphibia.

It is now necessary to see what was the probable condition of the reproductive system, and what would be the probable effect of an arboreal life upon such a creature.

Factors Influencing the Number of Offspring.

In the first place we may assume that, like most terrestrial Insectivora with which we are acquainted, this animal would produce large numbers of offspring at a birth. Among the terrestrial Insectivora the maximum of mammalian fertility is displayed; very large litters are produced by many species, and *Centetes* is known to produce 20 young at a birth. This is, however, an unusually large family for a Mammal, and taking our common English Shrew (*Sorex araneus*) as a guide we might suppose its litters to average seven or eight with a common advance to ten or even more young. We would picture it as having a large series of nipples, thoracic, abdominal, and inguinal, to supply the wants of this large family; and we would expect the female to possess a uterus consisting in the main of two long "uterine horns" in which these multiple embryos could be accommodated.

How will arboreal life affect such an animal with such a family? It is no mere speculation to say that large families become inconveniences among the branches; and that the disadvantage of large families will be felt in two ways. There is first the disability imposed by pregnancy, and secondly the difficulty of accommodating and nursing a large family up a tree. It is not only in arboreal life that these difficulties are encountered, and in many different types of Mammals and in many different situations they have been solved. The solution has always ultimately been the same—the reduction of the family.

That the climbing activities of the female, when pregnant of a large litter, would be hampered seriously seems obvious; and yet the reality of the disability becomes still more striking when we study those curious pelvic changes which are well known to occur during pregnancy in many large-littered animals. In some Rodents stretching, and

partial solution of the continuity, of the pelvic ligaments go on to such a degree that the pelvis becomes more or less unstable as a pivot for the hind limbs, and ordinary terrestrial progression becomes reduced to a mere waddle. Such a condition of the female is obviously unsuited to activities among the branches.

Large families can therefore only be indulged in, as a rule, by animals the females of which may be exempted from any very exacting activity during pregnancy. Such is a general axiom among the Mammals, and leaving altogether the stock with which we are most concerned, examples of its truth are readily furnished in many Orders. Herbert Spencer gave much thought to the well-known instance of the relative fertility of the hare and the rabbit. Much of his speculation was no doubt true; but we must not overlook the fact that a doe rabbit's home is safe in a burrow, while the female hare has no such protection. And the same cause that has led to the reduction of the hare's litter has been at work, with even greater force, among the Ungulates. Again, in aquatic life the same disability is felt, and the picture of the pelagic life of the whales makes the second axion—that where there is no nursery there will be no large families—more real.

This factor would no doubt be felt severely by the pioneers of arboreal life, for it is easy to imagine the difficulty of dealing with large numbers of helpless offspring which are unable to follow their mother about the branches. The difficulty is one which the animals with a leaning towards arboreal life have attempted to overcome in more ways than one. Of course, the female may descend from the trees at this time and produce and rear her young upon the ground; but this leads at best to a life that is only semi-arboreal, and there are many animals (such as several Felidæ, for example) which lead such a life.

Nest Building.

The next step is the attempt to provide some nursery for the progeny in the adopted home of the parent; *this is the dawn of nest building.* Most of the terrestrial Insectivora construct rather more than a mere lining for the retreat in which the young are born, and many are distinguished as nest builders. Those shrews whose domestic habits have been at all studied are known to rear their young in very well constructed nests. Such ability in nest building may be carried further even by terrestrial forms. Our common English Shrew (*Sorex araneus*), although as a rule resting on the ground, is capable of an advance in the direction we have been imagining, and it has been known to construct a very good nest 3 feet up in the branches of a young spruce fir.

What *Sorex* can do on occasion it would seem *Tupaia* does under ordinary circumstances. The nests of some of these animals have been studied, and although with regard to *Tupaia minor* Charles Hose did not feel certain if the *Tupaia* had made its own nest or used one already built by a bird, there would seem every reason to believe that with most species the nest is the work of the animal itself. Our hypothetical Insectivore, therefore, probably found nest making easily within its powers, and so made the conquest of the branches more certain.

Turning again to other stocks we see how readily nest building is adopted by arboreal or semi-arboreal Mammals. Our harvest mice (*Mus minutus*) are adepts, and dormice (*Muscardinus*) and squirrels (*Sciurus*) and many other Rodents construct extremely good arboreal nurseries. Again, among the Marsupials certain species of *Phascologale* adopt the habit of arboreal nest building, and these animals suggest some speculations that will be dealt with in their proper place.

Reduction of Number of Offspring at a Birth.

Nest making was an early solution of the arboreal nursery problem among the forerunners of the Primate stock. *Tupaia* retains the habit, and more remarkable still that aberrant Lemur, *Chiromys*, resorts also to the same practice; according to Mr. L. Baron "it builds a nest about two feet in diameter of twigs and dried leaves in the dense foliage of the upper branches of trees. The nest is entered by a hole in the side."

Nevertheless nesting is obviously a habit that must be left behind in the progress of evolution; although convenient for small animals with large litters, it becomes exceedingly inconvenient for larger species, and nest building we may look upon as merely a temporary expedient in the development of the Primate stock—an expedient adopted only so long as the production of large litters was prevalent. The typical Lemurs have, so far as I can learn, abandoned the habit; and it is to be noted that in the special case of *Chiromys* the nest that is built is probably not merely a simple nursery, for it provides a shelter for the adult in the same manner as the branch platforms constructed by some of the higher apes. In *Chiromys* the ultimate factor—the reduction of the family—has already come into play and only a solitary offspring is produced at each birth; nevertheless, the retention of the nest nursery has probably led in this instance to the development of one anatomical peculiarity which will be discussed later.

The end of all the adaptations of reproductive habit to arboreal life is the reduction of the number of offspring produced at a birth. All those truly arboreal Mammals which mark the line of human descent display this relative infertility. Among the Lemurs, although two young are occasionally produced at a birth, it is the rule that only one offspring is born. With all the *Cebidæ*, *Cercopithecidæ*, and *Simiidæ*—the whole class of the Monkeys and Apes—a solitary baby is alone produced at each pregnancy, as a rule, but upon occasion two are born.

There is a very widespread belief among the natives of Java that when a monkey has a family of more than one it is the custom for the mother to let them cling to a branch, and to rear only that one which remains clinging after the branch has been well shaken. I know not what reliance is to be placed upon the accuracy of this story, but it has been vouched for by a very observant Englishman, and it is not unlikely that the tradition represents, at any rate, a summary of the working of one factor causing the reduction of arboreal families.

Further back in the mammalian story among the Endentata such truly arboreal animals as the Sloths (*Bradypodidæ*) produce but one young at a birth, and the arboreal Pangolins (*Manidæ*) not more than two.

The Emancipation of the Fore Limb.

There is another, and a most important, change produced by arboreal life, and although this new factor has primarily no relation whatever to reproductive habit, and ultimately leads to the most

far-reaching developments altogether outside this function, nevertheless it exerts its influence upon the reproductive system in some remarkable ways. This new factor may be named "the emancipation of the fore limb"; and it makes itself evident in varying degree in all arboreal types. The fore limb becomes freed from the sole use as an instrument of mere progression in arboreal life. The important story of the emancipation of the fore limb, and all that it leads to, cannot be told here; but a brief summary of the steps, in as far as they concern the reproductive habit, is necessary.

In arboreal progression the hand grasps the branches, instead of the hoof or the paw being planted upon the ground; and from this beginning it becomes a member capable of grasping other things; of being used for a multiplicity of purposes from catching insects or picking leaves to conveying the food, so obtained, to the mouth. Among other results of this modification is the ability of the mother to grasp the young and the young to grasp the mother. *This is the dawn of nursing.*

Among the Lemurs it is the rule for the young to grasp the ventral fur of the mother, and in many species the mother displays but little ability to hold or carry its offspring in its arms; indeed, according to Charles Hose, *Tarsius spectrum* has made so little progress in this direction that at times it carries its young in its mouth after the fashion prevalent among cats.

The young of *Nycticebus tardigradus* is so small, and clings so closely among the dense fur of its mother's ventral surface, that it is extremely difficult to find and dislodge. Even native dealers will occasionally sell two animals as one, so difficult is it to detect the tightly clinging young. In this species, and, I believe, in other Lemurs, the young one sometimes has its head towards its mother's head and sometimes towards her tail. In the animals that I have had in captivity the common position was for the infant to grasp the mother's chest with its legs, and cling to the abdomen with its hands, its head being pressed against the mother's inguinal region. With *Lemur catta*, apparently, the tail of the young assists it to hold on to its mother, a method that has been carried to great perfection in truly prehensile-tailed animals of other stocks such as *Didelphys lanigera* among the Marsupials.

Care of their Young by Monkeys.

Among all the Anthropoidea not only can the baby cling to its mother, but the emancipation of the fore limb has proceeded so far that the mother can hold and nurse the young. In most monkeys the young clings to the mother with its face against the mother's chest, its hands gripping the fur of her sides and the feet grasping her loins, and so travels back downwards in ordinary progression. This is the method in all the Old World monkeys that I have seen either in a state of nature or in captivity, and it is that usually described as typical; but Bates, speaking of *Uacaria calva*, says: "The mother, as in other species of the monkey order, carries her young upon her back." If this indicates that there is a real difference in the nursing habit of Old and New World monkeys, or simply means that Bates was observing rather older infants, I have not sufficient evidence to decide.

When the mother is at rest, however, there is no doubt as to the method of holding the young; and everyone must have noticed what Owen describes as "a very human fashion" of nursing typical of all monkeys. The very perfection of its likeness to human nursing renders any description superfluous but nevertheless the influences of this factor must be noted, for in some ways they are so very far-reaching in the advance towards higher conditions.

We have noted before that in situations other than the tree tops it has been necessary to limit the family for the reason that no natural nursery is to hand; but it is the peculiarity of the tree-top baby that it has a real infancy, and of the tree-top mother that in her is developed to the full the whole sum of attributes comprised in the expression "maternal care."

Among large numbers of the Ungulates (for example, the Horse) the offspring knows no nursery and is usually solitary; but it is born very mature and has but little childhood; for it must be prepared to flee at its mother's side upon the approach of danger. The arboreal baby, on the other hand, is born immature—its period of infancy is prolonged, and throughout its long stage of helplessness it must be carried and cared for by its mother. A very exact parallel is seen among birds, for the ground-nesting species (such as *Rallus Philippensis*, of which the young is running for its life in the undergrowth less than an hour after it has chipped its shell) contrast sharply with the helpless young hatched in the tree tops.

This paper is an anatomical one, and it is not intended to trespass into the psychical advances initiated by these changes; and it is unnecessary to point out the influences in psychical evolution exerted by such factors as maternal care, infantile dependence, and the formation of the family. In brief it may be said, from the eugenic point of view, that arboreal babies tend to be few but well looked after; and, from the psychical point of view, that the prolongation of infancy paves the way for social life and all the mental advances consequent upon it.

MAMMARY GLANDS.

With the anatomical changes, however, it is necessary to deal more fully. It has already been pointed out that the non-arboreal Insectivora have a large number of mammary glands and nipples; indeed, it is among these animals that perhaps the most complete mammary series is seen. *Centetes* possesses as many as 11 pairs of functional mammary glands and teats, and *Solenodon* has the distinction of retaining the most caudal glands seen in any animal, for the posterior nipples are carried on the root of the tail behind the buttocks.

Now, as a general rule, there is a very natural agreement between the number of pairs of functional mammary glands and the number of offspring produced at a birth. With the reduction of the family the reduction of the mammary series goes hand in hand.

In *Tupaia* with its many offspring reared in the nest the mammary series is still large, and pectoral, abdominal, and inguinal nipples are all present. In all other members of the Primate stock, however, the reduction of the family has led to reduction of the nipples and mammary glands. This reduction takes place in no haphazard way; only so many pairs are retained as are required for the nursing of a normal litter, and the pair or pairs in the series which are ultimately selected for persistence are those which are most convenient in the nursing habit of the mother.

It is the fashion of suckling—a fashion ruled by convenience—that determines which members of the whole linear sequence are retained as functional sources of nourishment for the young. All other

members of the series undergo an atrophy, either complete or in part; nipples may persist, but milk-secreting glands disappear when function does not demand their existence. As a general rule it may be said that reduction of the mammary series first takes place in the intermediate—lower thoracic and abdominal—regions, the functioning glands persisting at the extremities of the series. The election of the distal members of the series as permanent mammary structures is demonstrated widely in the most diverse types of Mammals in which mammary reduction takes place in response to the lessened demands of a smaller family.

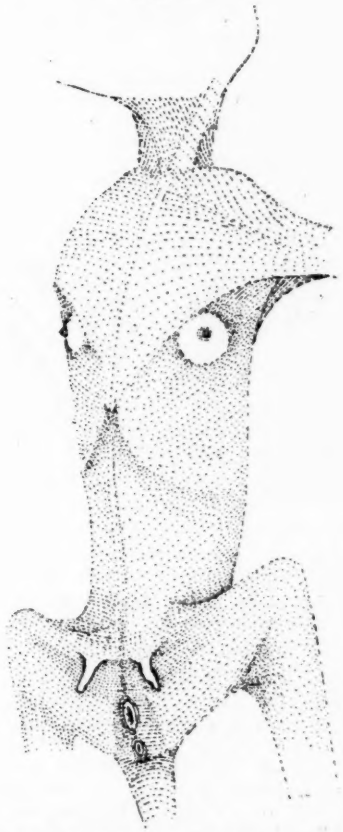
The functional element of convenience is perhaps best seen by turning at first to members of other stocks than that with which we are mainly concerned. In the mare, as an example of the true Ungulates, the mammary glands and nipples are just in advance of the vulva—a fact which arrested (and to good purpose) the attention of John Hunter. As a mare suckles the foal she can look all round for danger, she can keep her eye on the foal, she is able to graze unimpeded by her suckling offspring, and she can at once break into a trot if alarmed. With the elephant, on the other hand, it is the most cephalic pair of the mammary series that is retained. An elephant cannot flex its spine as a mare can; she could not look behind her at a calf suckling from inguinal nipples, nor could she control it with her trunk as nursing elephants are accustomed to do. The elephant calf therefore suckles from axillary nipples, where its mother can take care of it while she grazes with her trunk unimpeded by the presence of the suckling. The difference in position of the permanent mammary glands in the mare and elephant is therefore probably the outcome of convenience, ruled by the bodily conformation and life habits of the parent animal.

Anchoring Nipples.

Among the lower members of the Primate stock a mammary condition of the greatest interest is present. We have seen that among the Lemurs the young clings to the ventral fur of the mother with its back downwards and its head either directed towards the mother's head or towards her tail. This habit has led in most of the Lemurs to the retention of two pairs of distal nipples—a pectoral pair and an inguinal pair. The subsequent history of these nipples is correlated with the nursing habits of the different species. In some Lemurs the pectoral pair becomes predominant, while the inguinal pair degenerates, and in at least one species the reverse development is seen.

In captive specimens of *Nycticebus tardigradus* I have studied the functional meaning of these nipples. When the mother is moving about, climbing, eating, or searching for food, the young one, as a rule, has its head pressed against her inguinal region, and mother and offspring are opposed head to tail. In this attitude the young buries its face in the inguinal fur and grasps an inguinal nipple in its mouth. The position assumed by the young under these circumstances is doubtless to permit a greater freedom of movement to the mother when leading an active life among the branches. I do not know if the young *Nycticebus* obtains any nourishment from these inguinal teats, but I am inclined to believe that it does not, for obvious suckling takes place when the mother is at rest, and the baby, reversing its position, seizes a pectoral nipple. Doubtless in some forms these inguinal nipples are associated with functioning mammary glands and are a source of nourishment for the young, but I know no observations on this point. It is certain, however, that the general fate of these structures is that they become mere skin appendages unassociated with mammary glandular tissue, and thus cease to function as organs for the conveyance of milk to the offspring. (See Fig. 3.)

FIG. 3.



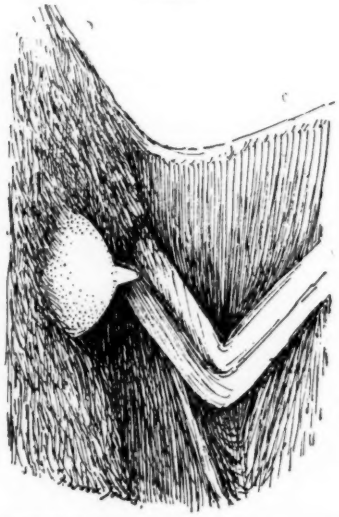
Reduction of the mammary series as it is seen in most Lemurs and some Bats. The pectoral mammary glands are functional milk-secreting structures, but the inguinal pair are reduced to the condition of "anchoring nipples."

Such nipples I shall call "anchoring nipples," for they serve merely to provide a firm basis to which the young may tether itself by its mouth. "Anchoring nipples" do not by any means degenerate, but become firm and elongated structures, which, though mere skin appendages, are reminiscent in their form of the Marsupial teat, which is an anchoring as well as a milk-supplying organ.

It is, perhaps, best to note here that anchoring nipples are not confined to the Lemurs. Among certain families of the Bats they are well developed, for the young of these animals clings to the mother's ventral surface and attaches itself to an inguinal anchoring nipple while the mother is in flight, but suckles from a pectoral nipple when the mother is at rest. This condition is exemplified in most of the common species of rhinolophid Bats, but the details have been especially noted in the literature in the case of *Rhinolophus ferrum-equinum* by Rollinat and Trouessart, who have named these nipples as the "faux tétons du pubis."

The position of the Cheiroptera with regard to the Primate stock, which we are now considering, will be noted later; but it is of interest to observe here the identity of mammary development in the Lemurs and in certain members of this Order. It will be recalled that it was the possession of a pair of pectoral mammary glands by the Bats that decided Cuvier in placing them among the members of his Primate order. (See Fig. 4.)

FIG. 4.



The remarkably human type of pectoral mammary gland of a Bat (*Brachyphyllum cavernosum*).

There is, however, at least one Lemur—the aberrant Chiromys—in which the inguinal nipples are apparently not reduced to the condition of anchoring nipples, but remain associated with the functioning mammary gland and are the source of infantile nourishment. According to Owen Chiromys possesses "but one pair of nipples situated about an inch and a half in advance of the vulva." I should imagine that the retention of inguinal nipples and mammary glands in this animal was probably the result of its nursing its solitary offspring while lying on its arboreal platform. The nest-building habits of this curious Lemur have been mentioned previously, and this habit, taken in conjunction with the fact that Chiromys produces but one offspring at a birth, possibly accounts for the retention of a pair of inguinal mammary glands as a matter of pure convenience in nursing the offspring in a nest. Chiromys must, however, be considered as an exception in this particular to the general trend of evolution in the Primate stock, for the the tendency is for the inguinal anchoring nipples to wane while the pectoral mammary nipples increase in size and importance.

Functional Explanation of Mammary Development.

This process takes place step by step with the increasing ability of the mother to grasp the baby. When the mother can hold and carry the baby the inguinal anchoring nipples are no longer of use and they undergo an atrophy; the infant being nursed in the arms and held to the more convenient pectoral nipples, the glands associated with these nipples become enlarged, and ultimately, in the higher members of the Primate stock, become the sole representatives of the long linear series of the lower Mammals. It is, however, worthy of note that even in the human female inguinal nipples may reappear. Such a case is that of a woman described by Testut and quoted by Blanchard and Rogers Williams in which inguinal nipples associated with mammary glands existed.

It may be urged that although such a functional explanation is a plausible one for accounting for the mammary development of the Primates, yet it might in reality be some more obscure but inherent peculiarity of this stock to develop mammæ in the pectoral region; that the perfection of the human breast was surely more than the mere outcome of the convenience of some lowly Primate compelled to suckle its offspring amidst the branches of a tree.

Any doubts are, I think, dispelled by turning to other arboreal animals which are not usually admitted to be near relations of the Primate stock. Assuming, as we are entitled to do by all classifications accepted by modern zoologists, that the Edentata have no very intimate affinities with the Primates, then it must be an example of the development of similar anatomical adaptations to meet similar functional necessities that results in the typical mammary condition of the Sloths and their allies.

In these Edentates all the phases which we have followed in the Primate stock are displayed to perfection; the animals have become arboreal; the family has become reduced; and while some species possess both inguinal and pectoral mammæ, in others (the most purely arboreal forms) the inguinal nipples are lost and only a strikingly Primate pair of pectoral mammæ persists.

Another animal whose mammary condition needs mention here, though its zoological position will need discussion in another place, is the anomalous creature (*Galeopithecus*) sometimes known as the "Flying Lemur." The solitary offspring of *Galeopithecus* clings to its mother as do the young of Lemurs and Bats, and in this type again a pair of large pendulous mammary glands is situated upon the sides of the chest.

Possible Tendency to Unilateral Mammary Development.

We have followed the steps by which a reduction of the family leads to a reduction of the mammary series, and we have noted the process by which nursing in the arms led to the selection of the pectoral pair as the permanent human mammary glands. It is easy to understand that since the primitive mammary lines are bilaterally symmetrical structures, symmetrical mammæ will persist even when the production of only one offspring at a birth is the established rule. But it is also natural to ask if long continuance of this state of things may not tend to a unilateral mammary development; if the long-established habit of suckling only one offspring may not tend to the development of only one functioning breast.

From what we know of the laws of symmetry in the animal body it does not at first sight seem likely that any such tendency should be manifested. None of the Lemurs, Monkeys, or Anthropoid Apes show, so far as I know, any tendency to asymmetrical development of the mammæ; but the fact has been known to artists, physicians, and anatomists from the very earliest times that in the human female the left breast tends to be somewhat larger than the right. This fact is noticed time and again

throughout the literature. Here we have a possible human tendency in mammary development; and again this tendency is the outcome of pure convenience in nursing.

Man has distinguished himself from all the other Primates in the almost universal preference for the specialised use of his right hand. The Primates lower than Man know no distinction in the use of right or left; Man alone shows a preference to perform specialised movements with one hand rather than the other. It is a matter of indifference to a monkey if the infant be carried on the left arm or on the right, and it is accordingly suckled indifferently at either breast. The majority of women, however, prefer to nurse the baby upon the left arm with its head towards the left breast, the right arm being free to perform other duties. This preference for suckling the infant at the left breast is manifested in women apart from any question of race or racial habit, and must be regarded as an outcome of the human tendency to asymmetrical specialisation in the use of the fore limbs.

One other factor has come into operation here, and this is the increasing separation of the mammary glands in the human as contrasted with the monkey type. This separation is brought about mainly by the widening of the chest, which is itself doubtless an outcome of the more upright posture of Man. In some Monkeys the breasts are so near together that the young of *Cercopithecus lalandii* has been seen to suckle from both nipples at once. This is, of course, impossible with the human type of chest and mammary gland; it must be one breast or the other, and selection is favouring the left breast.

THE INTERNAL GENITALIA.

As for the internal genitalia there can be no doubt that the arboreal habit has brought about the greatest changes. We have already seen that with regard to the lower segment of the female genital tract it is possible that the tree-climbing habit has left its mark very clearly indeed. We have noted that the length of this portion of the tract varies with the extent of the ventral pelvic symphysis, and that with the splaying out of the symphysis the tract becomes reduced in length. In this way the urogenital sinus has become progressively shortened until in the human female it is altogether absent; the long common chamber which exists with an ischio-pubic symphysis being opened out, as it were, by the splaying aside of the ischiatic rami. Hand in hand with this we have noted a progressive reduction of the male copulatory organ, and the development of this organ according to a very special type.

With regard to the upper portion of the internal genital tract of the female I am convinced that the reduction of the family consequent upon the arboreal habit has produced the very greatest changes. These changes are worthy of consideration, for to my mind we need some readjustment in our ideas concerning the progress of the evolution that has resulted in the production of the essentially human type of uterus.

It is possible for the student of pure human embryology to press his views too far; and in the explanation of many human anomalies I think it is probable that too much weight has been attached to mere mechanical interpretations of phases described as occurring in such human embryos as have been recorded in a series of different stages. To be properly interpreted ontogeny must be checked at every turn by phylogeny, and the mere structural study of sections and models should be controlled throughout by some appreciation of the physiological need of the developing animal for the special type of development of individual organs and systems.

It is, to my mind, essential in the study of the development of the human internal genitalia to keep constantly in view the fact that the chief modification has been imposed by the arboreal habit, and is an adaptation for procuring a system which shall accommodate only a single offspring during its pre-natal stages. The evolution of the uterus from the so-called "low mammalian" to the so-called "high mammalian" stage is merely a process by which a system designed for the reception of a large number of embryos is given up, and a system is evolved which is adapted solely for the needs of a single embryo. The differences between the processes as I shall describe them and those usually described may not seem great in detail, but the difference in functional conception of the evolution is considerable.

The Development of the Uterus.

I need not remind you that we generally assume that, from a condition of completely separated Müllerian ducts, evolution proceeds by stages of a partial fusion over a greater part of their extent; that whereas a lower Mammal has a large unfused portion—represented by the uterine cornua—these cornua have been fused and coalesced completely in the corpus uteri of Man. Such a theory is apparently supported by a whole series of anomalies which are well known to occur in the development of the human uterus. This conception might be summed up by saying that in Man the whole of the Müllerian ducts are fused into a common chamber, with the exception of that portion which forms the Falloppian tubes; and that the human uterus represents the coalesced uterine cornua of the lower animals. Such a conception has an initial inherent improbability, since the aim of evolution in producing the human type of uterus has not been to make a large median chamber out of two previously large bilateral chambers, but rather has been to perfect a single small chamber destined to accommodate a single offspring. The generally accepted explanation of the evolution of the Müllerian ducts is, to my mind, an example of embryology run riot for want of the proper controlling study of phylogeny.

Far from the development having taken place by the retention and fusion of the largest segments of the Müllerian ducts, it has taken place by an absolute reduction of a portion of the duct; for that portion of them which forms the uterine cornua of lower animals has, I believe, disappeared in man. The portion of the duct which forms the uterine cornua is destined to be the bilateral nidus of numerous offspring in the lower animals; this portion shrinks with the reduction of the family; it disappears when it is the established rule for the family to be reduced to a single offspring.

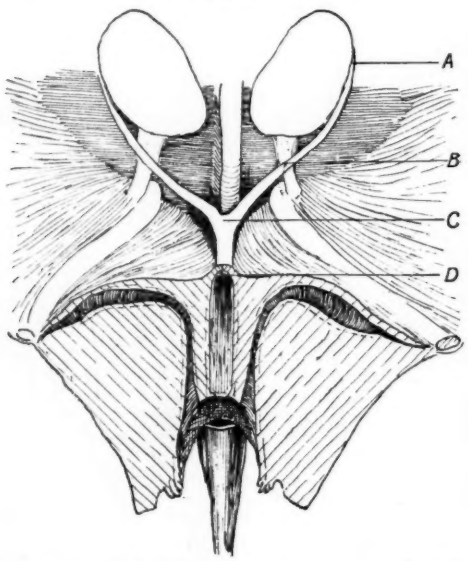
Quite apart from any study of embryology its reduction is strikingly displayed in the mammalian series. It is only necessary to contrast the uterine cornua of the large-littered pig with those of the mare to see that far from a median fusion of the cornua taking place to form a corpus uteri, it is the uterine cornua that are themselves dwindling in response to the diminished demands for the accommodation of multiple embryos.

Phases of Uterine Development in the Embryo.

Turning to the actual phases in the developing embryo, I think the process is made abundantly clear; and I imagine that the human uterus represents the caudal, median, fused portion of the Müllerian ducts such as is present in most lower Mammals, but that the uterine cornua are wanting in man. It is not that they are fused into the common chamber of the median uterus of man, but that they have disappeared in the process of development.

In the early stages of the Müllerian ducts all embryologists recognise three well-marked portions; the first, which lies in the long axis of the body and stretches from the cephalic end of the tube, at the ostium abdominale, to the gubernacular strand; the second, which is transverse to the long axis of the body and stretches medially from the gubernacular strand to the mid-line where it enters the genital cord; and the third, which is again in the long axis of the body and lies in the genital cord. (See Fig. 5.)

FIG. 5.



The female genital ducts of a foetal mare. A–B, Falloppian tube segment. B, Gubernacular strand. B–C, Cornuate segment. C–D, Uterine or genital cord segment.

The fate of these three parts is easily followed. The first part forms the Falloppian tube; the second the uterine cornu; and the third (in which alone fusion ever takes place) the corpus uteri. The first two portions are suspended in their own bilateral mesenteries, and these portions do not fuse in any animal; the third portions are incorporated in a common mesentery, which is part of the genital cord, and these portions fuse in most (but not all) Mammals. The gubernaculum in the female persists as the round, or uterine, ligament of the ovary, and as the round ligament of the uterus. The first portion is therefore all that part of the Müllerian duct which is cephalic to the crossing of this strand; the wide-bored and thick-walled Falloppian tube of Man, or the narrow, thin-walled, and tortuous Falloppian tube of the lower animals.

It is sometimes assumed, even to-day, that the human Falloppian tubes are the representatives of the cornua of lower animals, and that the abnormal human tubal pregnancy is in some way a reversion to the condition of normal pregnancy in the uterine horns. Many of the older anatomists considered that the human Falloppian tubes were the homologues of the cornua of lower animals; Gerardus Blasius (d. 1684) makes use of this homology throughout his works on comparative anatomy. But it was recognised early that there were essential differences between the two structures, for Harvey says: "In a woman, as we have said, the two Trumpets near the process of the neck of the womb, which are perforated into the cavity thereof, are not commonly reputed proportionable to the Horns, but are conceited by some anatomists to be Vasa spermatica; by others Spiramenta uteri; by a third sort Vasa semen deferentia aut reservantia." But Harvey himself would have none of these ideas, and he lays it down as his opinion of the Falloppian tubes that "in truth they are answerable to the Horns of the womb of other animals."

The second portion stretches from the round ligament to the sides of the corpus uteri—this is the uterine cornua of the lower animals, but in man it is either altogether absent, or, if present at all, is represented by the so-called "interstitial portion" of the tubes. The third portion forms an inconspicuous median uterine chamber in most lower Mammals and constitutes the uterus of man.

The second, or intermediate, portion of the tubes—i.e., that part running primitively in the transverse axis of the body—is at first quite long in the human embryo. In the 19·4 mm. embryo the condition is similar to that seen in the lower animals which possess long uterine cornua; from the point of crossing of the gubernacular strand a considerable length of the human embryonic duct is taken up in the passage towards the middle line. In older embryos this portion appears relatively less and less developed. Its growth seems to cease altogether, while the portions upon either side of this stationary interval enlarge considerably. In this way that point on the tube to which the gubernacular strand adheres in its crossing alters its position relatively to the extremities of the tube; and we have only to look at the different courses taken by the gubernacular strand in the two main types of uterus, and in the intermediate forms which link them, to gain some idea of the relative degree to which the different portions of the tube develop in these types. With elongation of the second—or cornuate—portion of the Müllerian ducts the round-ligament attachment becomes moved in an upward and outward direction as the tube between it and the genital cord increases in length. (See Fig. 6.) On the other hand, with shrinking of this cornuate portion the point of attachment becomes dragged nearer and nearer to the genital cord, so that a sharp angle is developed between the portion running from the ovary to the tube, and the portion running from the tube towards the inguinal region. (See Fig. 7.) With further shrinking of the cornuate portion this angle becomes more marked until, with the final atrophy of the cornua, the gubernacular attachment is dragged in to the sides of the genital-cord portion, and blends with the musculature of the wall of the median uterine chamber. Such a condition is seen in the human uterus.

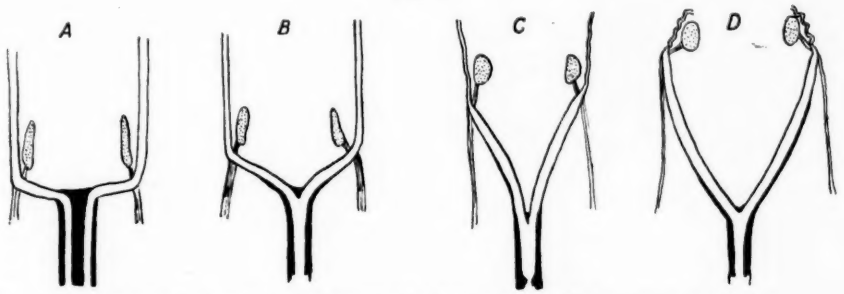
Stages of Uterine Evolution.

These stages of uterine development are all seen in members of the stock with which we are most concerned. Among the Insectivora Cloacaperta the uterine cornua constitute two entirely distinct chambers, there being no fusion even in the genital-cord portion, but in other members of the order the long cornua are united in the genital cord to form a small uterine body. The condition seen in the Tupaiadae (*Tupaia ferruginea*) is of interest. The Falloppian-tube segment is short, and although not markedly tortuous is of very narrow bore; the uterine cornua are long and capacious, but the corpus uteri is well marked and is conspicuously delimited by a well-marked os uteri leading into a vagina and urogenital sinus.

Among the lower Lemurs some extraordinary reversions to a low type of the Insectivora are displayed; but these reversions for the most part involve only the lower portion of the genital tract, and the uterus shows a steady advance (or rather adaptation to a single offspring) upon the stage seen in Tupaia. Indeed, no better summing-up of the general characters of the lemurine uterus could be given than that furnished by John Hunter in his description of the Lemur, which he terms the "Mongoose or Mocock." "The uterus," he says, "is between that of a monkey and of a common quadruped; or is what may be called the first stage towards the quadruped's or double-horned uterus." Such a condition may be illustrated by an examination of the internal genitalia of *Tarsius spectrum*. In this animal the Falloppian-tube segment is of narrow bore and slightly tortuous; the uterine cornua are comparatively short and thick, while the uterine body is well developed and is distinctly marked off from the vagina by an os uteri.

The next stage of development of the lemurine uterus may again be recorded in the words of Hunter, for in speaking of a lemur's uterus in which reduction of the horns has gone still further, he likens its outline to that of "the heart as it is painted upon cards." In the monkeys the reduction is still more complete, and it is impossible to refrain from quoting again, this time from Owen, who, describing the uterus of Baboons and Macacques, says that the angles of the fundus are slightly produced "like a last indication of cornua."

FIG. 6.



Four diagrammatic stages in the development of the "cornuate" or multiple pregnancy type of uterus.

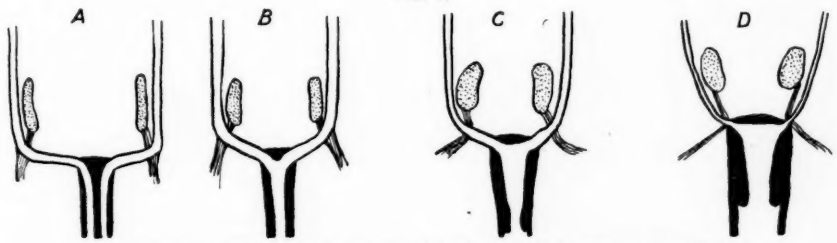
This is indeed the last indication of cornua in the Primate stock, for the anthropoid condition is similar to that of Man.

Uterine Evolution in Bats and Edentata.

In examining the mammary evolution, we saw that collateral evidence could be derived from a study of the Bats (which I am considering as an offshoot of this line) and certain of the Edentates. The same interest is attached to the uterine conditions found within the limits of these two same orders.

In the various families of Bats this uterine evolution is extremely well displayed. Among the Megachiroptera (fruit-eating bats) the uterine cornua may be entirely separate, no fusion having taken place in the genital-cord segment, and separate "uteri" are present. This condition is seen in *Cynonycteris* (*Xantharpyia*), *Hypsignathous*, and *Epomophorus*; but in some other genera there is a fusion in the genital-cord segment and a small corpus uteri is present. In the Microchiroptera (for the most part insect-eating bats) the most primitive condition of the Megachiroptera is again found in *Taphozous melanopogon*, which has entirely separated cornua. In *Rhynchonycteris*, *Saccopterix*, and *Enballonura* the cornua are still large, but the genital-cord portion is represented by

FIG. 7.



Four diagrammatic stages in the development of the simple or single pregnancy type of uterus.

a small corpus uteri. In *Nyctinornus*, *Nycterides*, and *Vespertilio* the uterine cornua are diminishing and the corpus uteri is more conspicuous. And the process culminates in *Phyllostomatidæ*, in which the uterus is of a simple human type possessing no uterine cornua.

Among the Edentata the uterine evolution is still more interesting, for associated with certain features in the internal genitalia which we must certainly consider as zoologically "low" are uterine features which are distinctly advanced, or, as we should say here, associated with the arboreal habit of producing a single offspring. Undoubted reversions to a primitive Insectivorous type are seen in the lower portions of the genital tract, but associated with this "low" condition is a uterus that can only be described as human in type. In certain Edentata the uterine cornua have disappeared, not by fusion in a high type of animal, but because the cornua are not needed to accommodate numerous offspring.

Anomalous Development of the Uterus.

It will possibly be objected that even if this picture of the development of the uterus be supported by phylogeny, and is an apparently justifiable interpretation of the stages recorded in ontogeny, nevertheless the well-known human anomalies support the orthodox explanation so thoroughly that it is essential that any other attempted interpretation must explain them equally well. To my mind the picture I have attempted to draw of the evolution of the Müllerian ducts furnishes a better explanation of the human anomalies than does the generally accepted theory.

The human bicornuate uterus I regard, not as a malformation in which the Müllerian ducts have failed to fuse, but as an arrested stage—a reversion, if the term be preferred—by which the internal genitalia fail to achieve their full development in the atrophy of the normally temporary cornuate portion. A rudimentary, or undeveloped, uterus will be arrested in some earlier phase, a stage represented, not necessarily by non-fusion, but by ill development of the uterine body and persistence of the cornua. That portion within the genital cord which undergoes a fusion, phylogenetic and ontogenetic, may exhibit varying stages of incompleteness of fusion, and so varying types of septate uterus or double uterus may result. Failures of fusion occur in the third, genital cord, or uterine segment; failures of retrogression occur in the second or cornuate portion; and both conditions are the outcome of arrests of normal development.

CONSIDERATION OF OTHER POINTS.

One or two points left unconcluded need some explanation. I have alluded to the Marsupial genus Phascologale in connexion with nest-building. The Marsupial stock is so far removed from the animals with which I am especially dealing that any detailed discussion of them would be out of place here. I need not point out, however, that I am putting forth no new or original thought in mentioning that the marsupial pouch itself is possibly an early and only partially successful solution of the problem of dealing with a family in a stock which is said to be primitively arboreal.

Again I have made more than one reference to the Chiroptera and to Galeopithecus. These forms I regard as offshoots from the stock which we have had under review. Offshoots which in pre-Eocene times had made a thorough conquest of the branches, but which had been over enterprising, and had, in learning to glide and to fly, lost that very emancipation of the fore limb which had carried them so far and permitted them to make their fatal experiment.

I am aware that this study does not warrant wide-reaching conclusions, and yet it has its significance in the study of human origins. Since in this system we see that arboreal life has brought about so much that we regard as "human" (and in other systems it is even more striking), should we find anything very incongruous in the blending of a very large number of typically "human" characters in a form which is still a very primitively arboreal "animal"?

THE ORIGIN OF HUMAN ATTRIBUTES.

Leave for a moment the train of thought that we have been following. Turn back in your minds to the works of the pre-Darwinian period. Bulky volumes will occur to you, volumes crammed with eulogistic descriptions of Man and all his attributes. Whole shelves of our libraries are devoted to such works, and there is no end to the written plaudits of the perfection of human characteristics.

The nobility of poise, the charm of proportion, and the general distinct, and unanimal, aloofness of the human body are described with unstinting appreciation. The special attributes of the human mind are paraded, and the realities of family love, the social life, and the glorious culmination in unselfishness and lofty thought are emphasised to point the intellectual separation of Man from the rest of the animal world. The whole sequence of this trend of thought and all that it implied will readily occur to you.

Over a wide interval of upheaval, chaos, and extremeness we will pass to the period of a scientific yesterday. The work of the morphologists is accomplished. Man is a perfected, but in many ways a primitive, animal. He has outclassed his Mammalian competitors, and become distinct from them in many bodily and mental changes. The distinctive poise of Man remains in the newer conception of these changes, even if the praise of human bodily grace and proportions is left to a past generation; and the assumption of the upright posture is the key to the solution of the problem of the origin of human attributes. Man the upright animal is the dominant note of modern human morphology.

It is a step backward from Man the upright to Man the tree-climbing, but it is a step which we must take in attempting to learn the origin of human specialisation. It was among the branches that necessity determined and opportunity perfected the special adaptations of human bodily and mental characters.

I have confined myself to a very limited study of a single system; but every system and every part of man's body tell plainly the same story. Even within the limits of the system whose evolution we have been following, I think it is possible to see that some of the peculiarly human psychology, which has been the subject of so much admiration from moralists and philosophers; some of the perfections of the human female figure lauded by artists and poets; and some of the characters of internal structures exploited by the morphologist, were impressed upon the animal body by the schooling of arboreal life.

[Towards the cost of some of the material used in this investigation assistance has been afforded by the Dixon grant of the University of London.]

PULSUS ALTERNANS IN SOME OF ITS CLINICAL ASPECTS.[1]

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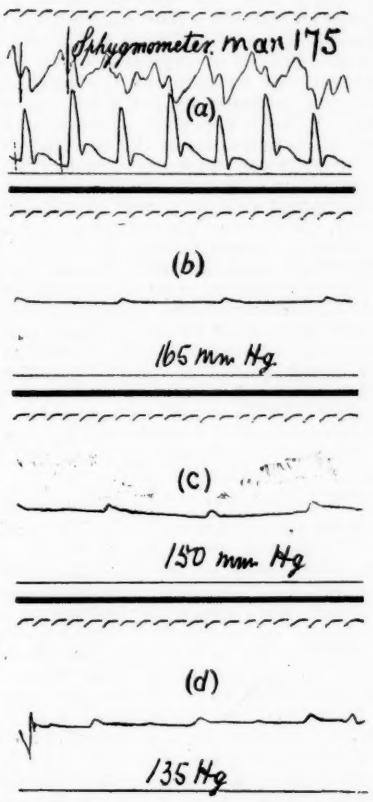
THIS communication deals with pulsus alternans in three different relations. The first of these is the bearing of pulsus alternans upon so-called blood-pressure records; the second is concerned with the clinical detection of an alternating pulse; and the third has reference to the influence of this form of pulse on prognosis.

Pulsus Alternans and the Sphygmometer.

When the sphygmometer is applied to a person in whom the arterial pulse has a normal and regular rhythm it is assumed that all the pulse waves are of equal force, and that the sphygmometer pressure necessary to suppress a selected series of radial beats is the exact measure, neither more nor less, of each individual beat. The measurement thus obtained is commonly quoted as the blood pressure or sometimes as the maximum blood pressure. As this external or sphygmometer pressure neutralises all the pulse waves during the selected period of observation, and as all the waves are assumed to be of equal force, the sphygmometer figure is accepted as an index of the force of each or any individual wave. Obviously this position must be modified in the case of pulsus alternans, for here the individual pulse waves are not of equal but of unequal force. Therefore a sphygmometer pressure necessary to suppress completely a series of such waves, that is, a pressure sufficient to neutralise the more forcible, must be excessive in respect to the less forcible. Hence if the sphygmometer measurement as ordinarily obtained is a record of the blood pressure, such a record in pulsus alternans must be incorrect in reference to 50 per cent. of the pulse beats. The figure which is true for the stronger waves is an exaggeration in relation to the weaker, just as the pressure needed to neutralise the less forcible waves would be deficient as a measure of the more forcible. In other words, the blood-pressure measurement as displayed by the sphygmometer must, in the case of pulsus alternans, be either a double one or an inaccurate one. If there is presented one figure representing the pressure associated with the more energetic pulse beat, and another figure for the pressure of the less energetic, the position may be harmonised with the values which the sphygmometer professes; but short of this there is no safety—to suppress all the beats is to err in the direction of excess; to suppress only the weaker ones is to err in the direction of defect.

The situation just defined is exactly illustrated in Fig. 1. The first tracing (*a*) is the ordinary sphygmographic picture of pulsus alternans, and the sphygmometer pressure necessary to suppress all the radial beats is attained when the mercurial column reaches a height of 175 mm. In the language of the hour, therefore, the patient has a blood pressure represented by the figure 175. If now the sphygmometer pressure is lowered to 165, some of the pulse waves come through (*b*), while others are suppressed; and it is obvious that the former are the alternate strong beats and that the missing waves are the alternate weaker ones. This experience is repeated when the sphygmometer pressure is further reduced to 150 (*c*), and it is not until the pressure has fallen to 135 that the alternate weaker beats are seen in the sphygmogram (*d*). If then the usual sphygmometer method were applied to this case the blood pressure would be recorded as 175, a figure which is manifestly inaccurate, as judged by the sphygmometer's own showing, in relation to one-half of any period to which the record may be held

FIG. 1.



to apply. The only alternative would be to register the blood pressure as 175 at one moment and as, say, 140 at the next succeeding moment, and to intimate that this alternation is indefinitely repeated. Now it can hardly be proposed that such alternation of blood pressure can be due to a rhythmical alternate contraction and dilation of the peripheral arterioles. Hence the difference in sphygmometer measurement between the alternate strong and weak beats must be due solely to a difference in the degree of cardiac force. But if this is true of differing pulse beats and differing sphygmometer measurements in one and the same individual, it must surely be true also of differing pulse beats and differing sphygmometer measurements in different individuals. The measurements vary, or may vary, as expressing different degrees of cardiac force—a display which, however interesting, is certainly not a complete picture of the blood pressure. In general terms, therefore, while the maximum sphygmometer reading as usually taken may afford an approximate intimation of the degree of force with which the

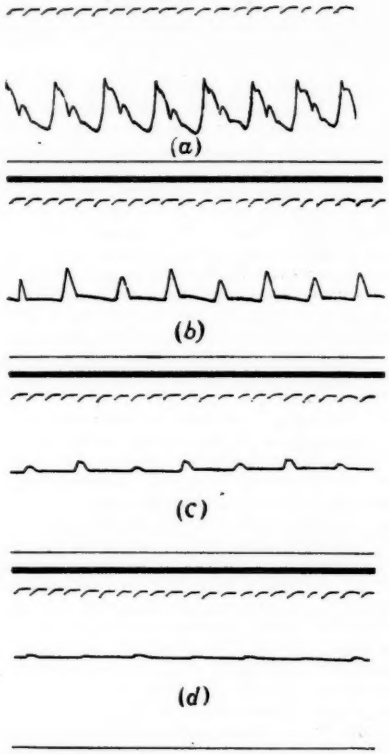
[1] The substance of this paper was communicated to the Association of Physicians of Great Britain and Ireland at the Cambridge Meeting.

systole of the left ventricle arrives at the brachial artery, it is far indeed from offering a comprehensive presentation of the state of the blood pressure. This is not to challenge the clinical value of the sphygmometer, at least within certain limits, but it is to advance a basis for the claim that records obtained by this apparatus ought to be expressed, not in terms of blood pressure but rather in terms of sphygmometric measurement. There are other considerations which support this claim. Thus, while the sphygmometer reading is a fact, its interpretation as blood pressure is an inference, and descriptive scientific terms ought to announce facts and ought not to enclose speculations or opinions; again, whatever contribution may be made to the sphygmometer record by the pressure of the blood, something—admittedly a very uncertain something—is contributed by the resistance of the arterial wall and perhaps also by the resistance of other tissues, so that, as a matter of fact, the reading is not purely a record of blood pressure; and further, stated at its highest, the claim of the sphygmometer, at least in its maximum record, is limited to the ability to present a single aspect of blood pressure—namely, the height to which such pressure rises during a period of time of uncertain, undefined, and therefore of possibly varying duration. These considerations certainly suggest the need for some care in the phrasing of sphygmometer records, and the argument now advanced is that a study of pulsus alternans in relation to such records adds strength to the suggestion that they should be recited in terms of sphygmometric measurement and not in terms of blood pressure.

The Detection of Pulsus Alternans.

The second proposition which I wish to advance is a more practical one. It is that a pulsus alternans which may escape the finger, and the stethoscope, and perhaps also the pulse tracing may be rendered evident and even conspicuous by the combined use of the sphygmometer and the sphygmograph. This is illustrated in Fig. 2. The radial pulse of the patient from whom these tracings were taken was certainly not suspected by the finger to have the characters of pulsus alternans, and, as seen in the first of the tracings (*a*), no such suspicion is justified by the sphygmogram. Yet if, while a radial tracing is being taken, more or less pressure is exercised on the brachial artery, the distinctive features of pulsus alternans come out very conspicuously. The difference between the height of the alternate waves is most decided when the sphygmometer pressure is at a moderate level (*b*), it is somewhat less decided as the pressure is increased (*c*), but it can still be appreciated even when the pressure is carried near to the obliterating point (*d*). The same truth is illustrated in Fig. 3, where the upper tracing was taken under ordinary conditions and each of the two lower ones while the brachial artery was subjected to a greater or less degree of pressure by means of the sphygmometer armlet. In this instance, however, it must be admitted that the original sphygmogram does offer to careful examination some hints of the presence of pulsus alternans. First, there will be noticed a slight difference in the height of the alternate waves; and, secondly, each of the less prominent waves is also less sustained, as is shown by the relatively less conspicuous "shoulder" or tidal wave. To judge from this tracing, therefore, the existence of pulsus alternans means an alternation not only in the force but also in the duration of the alternate cardiac systoles, and such an observation is the more interesting in view of the statement that no such variation can be discovered by the electrocardiograph.[2] The point here of importance, however, is that a condition of pulsus alternans which might well have escaped detection by the ordinary methods was readily made evident when a radial tracing was taken under the influence of pressure applied to the brachial artery through the armlet of the sphygmometer.[3]

FIG. 2.



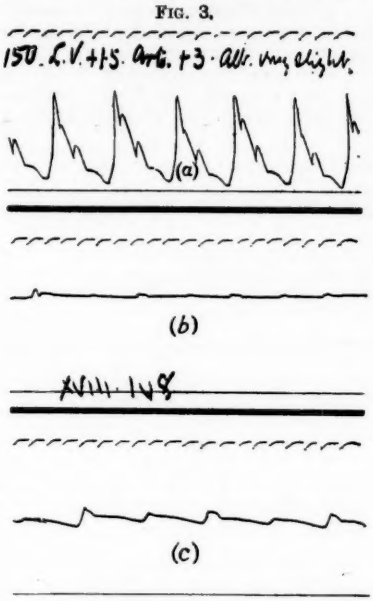
When the observations just described had once attracted attention it seemed necessary to test, almost as a matter of routine, the effect produced on the radial pulse tracing by pressure applied to the brachial artery. Without such test it appears impossible to be sure that any pulse, however regular and normal to the ordinary methods, may not perchance be, and as it were in a concealed fashion, an example of pulsus alternans. When this is done it is surprising to find how frequently a pulse which seems to be composed of equal waves, the products presumably of equally forcible cardiac systoles, offers suggestions that the waves are not really equal, and that the cardiac systoles which

[2] Diseases of the Heart, Dr. James Mackenzie, third edition, p. 258.

[3] Since writing this paper I have learned that an observation similar to that recorded above has been made by Dr. Louis Gallavardin, of Lyons, who, in an article entitled "Pouls Alternant et Cœur Alternant," published in *Le Journal Médicale Français*, Feb. 15th, 1913, writes: "La seconde conclusion est que l'on aura intérêt à *aider le doigt explorant la radiale, de la compression de l'humérale* au moyen d'une manchette brachiale pneumatique ou plus simplement d'un des doigts de l'autre main. On arrivera ainsi à mettre en évidence des alternances que la palpation radiale simple aurait sûrement laissé échapper. ..... Il y a ..... une alternance *latente*, insensible au doigt, invisible même sur les tracés sphygmographiques, et que la méthode sphygmomanométrique et l'exploration bidigitale parviennent seules à mettre en lumière."

produce them are therefore not equal. In Fig. 4 is seen a sphygmogram of which the constituent waves, all of them, have apparently an equal force and an equal duration. After the tracing had been taken the paper was removed and was again passed through the sphygmograph, while, at

FIG. 3.



the same time, the sphygmometer armlet was tightened around the upper arm to a degree sufficient to suppress the radial pulse. In this way the upper line of the tracing was drawn, and it shows that, though most of the pulsations are suppressed, every now and then a wave effects its escape past the sphygmometer armlet and is registered as a radial movement. Similarly in Fig. 5 the ordinary sphygmogram presents a series of waves of which every one appears to be identical with its fellows, yet when pressure is applied to the brachial artery the beats come through not in equal but in unequal excursion (*b*), and even when the pressure is urged to what appears to be the obliterating point there is still an occasional radial movement (*c*). In a word, these observations appear to show that even when the pulse waves as exhibited in a sphygmogram may seem to be of equal force and value, some of them, when tested, may, at least in individual instances, overcome a pressure to which others are obliged to yield; that, in short, the appearance of sphygmographic wave equality is not a final and conclusive proof of essential wave equality.

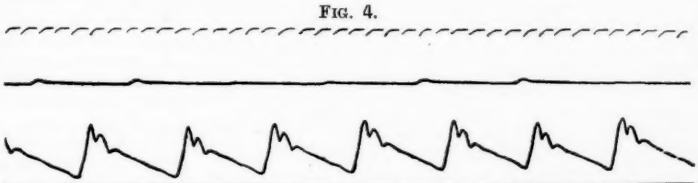
Is it, then, necessary to admit that pulse waves which appear to be equal may be the products not of equal but of unequal cardiac systoles? *A priori* this question would certainly be answered in the negative. Yet some explanation of the above facts must be found, and it is by no means certain that the *a priori* conclusion is the correct one. It is beyond question that the "escaping beats," as they may be called, of Figs. 4 and 5 are not due to a gradual fall of pressure in the sphygmometer, for were this the case they would, when once established, continue to appear, and presumably in an increasing measure; whereas, as the tracings show, the arrival of one or more of the "beats" may be followed by a more or less prolonged period of complete suppression. Nor would the suggestion of a falling sphygmometer pressure explain the irregularly unequal waves of Fig. 5 *b*.

Another explanation of the tracings (Figs. 4 and 5) now under discussion might be that the radial pulse movement varies in consequence of varying degrees of pressure exerted on the brachial artery as a result of involuntary muscular contractions in the upper arm. To exclude this proposal with complete confidence is not easy, and it is perhaps equally difficult to affirm it. Were it true there ought to be with each "escaping" beat a fall in the sphygmometer index—assuming the instrument to be sufficiently delicate for such a record—and personally I have not been able to detect any such happening.

At first sight it seems an extravagant suggestion to say that the "escaping" beats in Fig. 4, or the more marked waves of Fig. 5 *b*, are due to exceptionally vigorous cardiac systoles, for such a suggestion, in view of the corresponding and apparently normal sphygmograms, would involve the proposition that cardiac systoles which, measured by all the usual clinical methods, appear to be of equal force and value are really of unequal force and value. Yet when we find that this conclusion is necessitated in certain cases of pulsus alternans (Fig. 2), may it not be true also in instances in which the differences between cardiac systoles of apparently equal merit occur irregularly rather than in an alternating series? If inequality has to be admitted in the systoles responsible for the apparently equal waves of Fig. 2 *a*, how can we deny the possibility of inequality in the systoles of which the apparently equal waves of Fig. 4 are the product? All that is needed to bring the two tracings on to the same platform is to suggest that in one case (Fig. 2) the variation in the force of the systoles occurs with alternate contractions, while in the other case (Fig. 4) the variation is irregular and without apparent plan.

The conclusion just stated will appear less extravagant if it is recognised that the differences

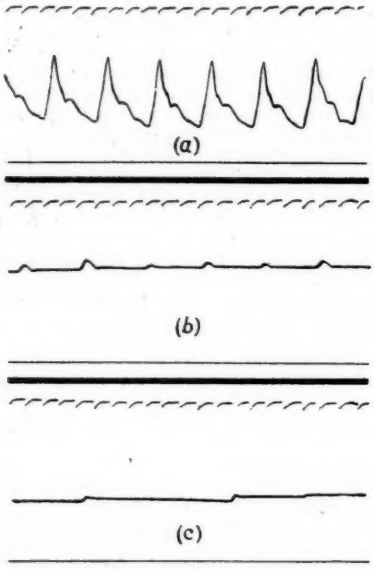
FIG. 4.



displayed in the apparently equal waves of certain sphygmograms when pressure is applied to the brachial artery may be differences which, in ordinary circumstances, are potential only, and that to expose them it is necessary to erect the special conditions which such brachial pressure implies. It is generally allowed that pulsus alternans, in the case of a heart predisposed to adopt this particular rhythm, may be excited or revealed by any circumstance which increases the degree of cardiac strain, and possibly obstruction of the brachial artery by the armlet of the sphygmometer may be such a circumstance. From this it

is no great advance to the suggestion that the same condition may perchance be sufficient to evoke a display of non-alternating variation in the force of the cardiac systoles when a tendency to such variation exists. In this way the two orders of events exhibited in the tracings which accompany this paper would be harmonised in principle, the only difference being that in the one group (Figs. 2 and 3) the armlet pressure reveals a tendency to an alternating variation in the force of the ventricular systoles, and in the other (Figs. 4 and 5) a tendency to an irregular (non-alternating) variation. Yet in each instance it remains true that these tendencies to an abnormal rhythm would not have been discovered unless, in addition to the usual methods of examination, the pulse had been tested while pressure was applied to the brachial artery. And this involves the admission that the apparently equal waves of a sphygmogram may arise from cardiac systoles which, if not unequal in the existing conditions, may at least be unequal in their capacity to deal with the circulatory position created by obstruction, partial or complete, of a medium-sized peripheral artery. Though the sphygmographic waves appear to be the products of ventricular systoles of identical value, a pulse-tracing taken while the brachial artery is subjected to pressure may show that such systoles are essentially unequal, at least in the sense that they vary in their ability to meet a new situation with one and the same measure of success.

FIG. 5.

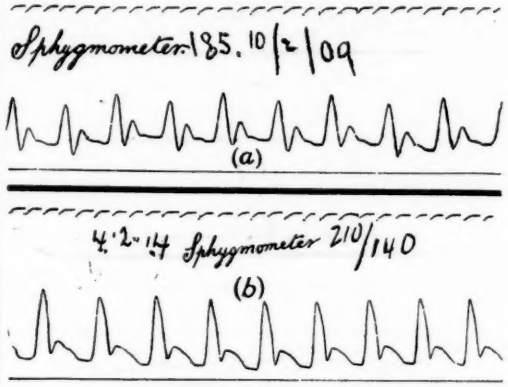


Apart from the discussion, doubtless somewhat speculative, of the significance of such tracings as Figs. 4 and 5, the tracings have this practical interest, that they show how easy it may be for different observers in one and the same case to record different levels of sphygmometer measurement according as the observation is made at a point where one or more "escaping beats" pass the sphygmometer armlet, or, on the other hand, during a period when all the waves seem to be suppressed. Whether the tactile or the auditory method of estimate be employed, the presence of these "escaping" beats is certainly not very uncommon, judging at least from observations made on patients of whom probably the majority were the victims of cardio-vascular degeneration. In cases of this order such tracings as Figs. 4 and 5 may be noted at least every now and again.

Pulsus Alternans and Prognosis.

There is a general agreement among writers on the subject that pulsus alternans almost invariably carries a very alarming prognosis. When exceptions to so serious a rule occur it is of some importance that they be recorded. As it happens, I am able to

FIG. 6.



quote a case in which the patient is still alive, and believes herself to be quite well, although so long as five years ago (Fig. 6 *a*), and on many occasions in the interval, her pulse has shown characteristic alternation. At the date of the first observation (1909) she was 22 years of age, and was found to present distinctive clinical evidences of chronic interstitial nephritis, including albuminuria, cardiac hypertrophy, a high sphygmometer reading, and extensive retinal changes. Yet she has continued to discharge her household duties as the wife of a poor man and the mother of three children, and she professes to-day to be quite well and free from all complaints other than occasional headaches. No doubt this sense of well-being is in some measure misleading, as the physical changes above described (other than the retinitis) still persist; on some occasions, too, the pulse tracing shows the features of pulsus alternans, whilst on others the tracing has the characters exhibited in Fig. 6 *b*. Allowing freely that the woman is not "cured" as she believes herself to be, there remains the fact that she is alive and active even though six years ago pulsus alternans in a quite decided form was part and parcel of her clinical state, and that it existed in association with the cardio-vascular changes which mark the progress of chronic interstitial nephritis. In view of the terms in which the prognostic significance of pulsus alternans is usually phrased such an experience is certainly noteworthy. The more serious the general rule the more welcome is it to find the possibility of exceptions.

Harley-street, W.

HOME OFFICE ORDER AND DEATHS IN BATHS.—The Home Office has issued an order that in the case of all deaths occurring in baths an expert pathologist shall be called in to make a thorough investigation of the circumstances and to give evidence at any subsequent inquest.

SOME ASPECTS OF THE CILIARY BODY IN HEALTH AND DISEASE.

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OF the structures composing the uveal tract the most important is the ciliary body. Herein it may be said that the soul of the eye resides. The ciliary body may be compared to the escapement mechanism of a watch. Just as the performance of a watch depends upon the protection of the delicate mechanism of its escapement, so does the nutrition of the eye depend upon the integrity of the ciliary body. In a watch the escapement forms the most delicate part of the movement. The pivots, for example, work in jewelled holes to lessen friction and diminish wear, and any disturbance of the accurate adjustment causes the watch to go irregularly or cease to go at all. Almost the same is the case with the ciliary body. Disturbance of its nutrition generally means impairment or arrest of the nutrition of the eye. While inflammatory conditions of other structures of the eye do not directly imperil the existence of the organ, inflammation of the ciliary body in more or less degree always does so. And the reason is not far to seek. The explanation lies in the special structure of the ciliary body and in the function it discharges. Anatomically, the outstanding features of its structure are its vascularity and sensory nerve-supply. As the blood organ of the eye it consists of a dense plexus of blood-vessels supported by connective tissue and arranged in the form of processes constituted from the inward folding of the various layers of the choroid. So, also, in similar density, is the distribution to the ciliary body of the sensory nerve-supply derived from the long and short ciliary nerves. The extreme sensory endowment thus provided is probably a special feature which Nature has been careful to arrange, in order that early warning may be given of the pathological dangers to which the ciliary body is exposed. By this means, in the case of an inflammatory attack the ciliary body is at once enabled to transmit a "S. O. S." call for therapeutic assistance. Useful in this regard as a symptom is the intense agony associated with an acute attack of primary glaucoma, indicating, as it does, the urgency of immediate relief. The pain in these cases is due to the vascular engorgement of the ciliary body, and to its compression against the unyielding sclera. For the same reason a primary iritis only becomes painful when the ciliary body is involved in the inflammation; an iritis, *per se*, is not painful, but when the attack is accompanied by pain, the eyeball is then found to be tender to palpation, showing the presence of cyclitis and the severity of the inflammation.

The next point which bears upon our theme is the function discharged by the ciliary body. It has already been observed that this function is mostly concerned in maintaining the nutrition of the eye. This is accomplished by ensuring a normal intra-ocular tension. The contour of the globe depends upon the two transparent media, the aqueous and the vitreous, and the ciliary body, by providing the fluid-supply, enables these media, under normal conditions, to preserve the tension required.

Incidentally, it may be noted that an interesting controversy has arisen in respect of the special means by which the intra-ocular fluid, represented by the aqueous, is derived from the ciliary body. In the first place, there are those who hold that the fluid is formed by filtration, and, secondly those who maintain that the fluid is manifestly a secretion. This diversity of view mainly prevails among the physiologists. Then the ophthalmic surgeons appear on the scene. They have a difference of opinion with the physiologists who favour the secretion theory. Since Collins, by an ingenious inquiry with bleached sections, demonstrated what he believed to be glandular bodies in the ciliary processes, attributing to them the secretory source of the aqueous, ophthalmic surgeons have generally accepted the revelation; but the physiologists, on the other hand, have shown no sympathy with this discovery. Their accepted view is that the aqueous is secreted entirely by the uveal epithelium covering the ciliary processes—curiously enough, this was practically the view propounded by Méry, so long ago as 1707. Moreover, it has been pointed out by Leber that the tubular invaginations of Collins have not the anatomical character of glands, having no secretory duct, no proper lumen, and no glandular epithelium.[1] In some recent correspondence which I have had with Professor Bainbridge upon this subject, he writes: "The view most commonly held, and which I share, is that the aqueous is formed by filtration through the ciliary processes." And so the matter, as indicated above, stands in the present day. The advocates of each view maintain their position. Possibly the controversy in the main may be reduced to an axiomatic statement—namely, that lymph is not a secretion, and the aqueous is not lymph. If lymph only were necessary for the supply of intra-ocular fluid, how is it that the protein content of the aqueous is negligible in comparison with that of lymph?

But the question of greater importance in this connexion is not whether the aqueous is a filtration or a secretion, but that its character varies, as the blood varies from which it is derived. Owing to its extreme vascularity the ciliary body is very responsive to blood changes. We see this in the irido-cyclitis of syphilis, of tubercle, of gonorrhœal rheumatism, of alveolar pyorrhœa, to mention some instances. In all these the aqueous undergoes a marked change in character, physically shown by a varying degree of turbidity. Turbidity of the aqueous means also a corresponding turbidity of the vitreous. Normal aqueous has been shown to be sterile. Again, aqueous is claimed to become toxic in cases of septic ulceration of the cornea, the toxin from the septic focus passing through the layers of the cornea, through Descemet's membrane, and so entering the anterior chamber. The effect of the toxin is to cause the aqueous to act as an irritant upon the tissues of the uveal tract, leading to the exudation of polymorphonuclear cells, which fall to the bottom of the anterior chamber, forming hypopyon. The aqueous is also toxic in irido-cyclitis of endogenous origin, and this explains the occasional presence of hypopyon associated with these inflammatory attacks.

The toxic condition of the blood, due to perverted metabolism, affects in varying degree the nutrition of the eye. Metabolic processes as a whole depend upon the controlling influence of the thyroid gland. In this regard two morbid entities represent the extremes of thyroid disturbance—hyper- and hypo-thyroidism respectively. On the one hand, "systemic goitre," as an American writer prefers

[1] Norris and Oliver: System of Diseases of the Eye, vol. i., p. 198.

to call exophthalmic goitre, and on the other myxœdema, in which atrophy of the gland is present. Between these two extremes lie diseases of metabolic origin of lesser magnitude, the signs of which are those of hypothyroidism. The simplest form, I believe, of this toxæmic influence of metabolic perversion is met with as an ocular manifestation. It has been customary to ascribe so-called "muscæ volitantes" to a physiological source. The physiological basis of their presence is attributed "to the persistence of portions of the framework of the fœtal vitreous" (Collins). The fact, notwithstanding, remains that this entoptical disturbance of the vision only becomes troublesome to those who for some reason at the time believe themselves to be suffering in health, for only on these occasions is it that complaint of "black specks" is made. At other times there is freedom from the trouble. Hepatic disturbance is the popular conception of the cause. The history of these cases suggests that "muscæ volitantes" is a pathological, rather than a physiological, sign. They indicate that some metabolic disturbance has ensued by which the aqueous has become defective in transparency or in some degree changed from its normal character. In one case a patient alleged to me that he was always troubled with muscæ volitantes at business on the day after attending a public dinner. He attributed the sign, which ceased to be noticeable after some hours, to the food taken being imperfectly digested. In the cases where muscæ volitantes remain persistent hypothyroidism in some degree may be inferred, for which thyroid treatment is indicated. So far as the eye is concerned the sign is of no import, but regarded as a systemic manifestation its recognition may prove of value to the patient.

When we come to consider inflammatory states of the ciliary body there is in certain cases clear evidence of the evil influence of metabolic disturbance. In so-called serous irido-cyclitis, or more commonly, keratitis punctata, or, shortly, "K.P.," the signs of hypothyroidism are distinctly manifest in the patient. The etiology, nevertheless, of this disease has never been definitely determined. The disease is distinguished by a chronic passive inflammation of the uveal tract, accompanied by the deposition of "dotted opacities" upon Descemet's membrane, which assume a triangular outline, with the base downwards. These "dotted opacities" consist of "lymphocytes and plasma cells" derived from the uveal tract, exuded as the result of the toxæmic irritation of the tissues. The history in such cases is always typical. Apart from the ocular signs the patients complain of loss of appetite and flesh, of physical and mental depression, of coldness of the hands and feet, and of overwork, to the effect of which the signs are attributed. Thus these cases are met with mostly among women whose ordinary strength is unequal to the demands of their occupations. The metabolic origin of these signs, due to hypothyroidism, is proved by the rapid improvement which follows thyroid treatment. With 3 grains, twice daily, of thyroid extract even in the course of a week a noticeable change ensues. A marked feature is the early return of the appetite, and partly, no doubt, from this patients soon begin to increase in weight. In the course of a few weeks the irido-cyclitis has cleared up, the appetite has become vigorous, physical and mental alertness have become visible in movement and facial expression, and convalescence is practically established. One among many typical instances of the kind was in the case of a former West London Hospital nurse, who, while private nursing, fell under the ban of these symptoms through an excess of night duty. The value to her of thyroid treatment met with a response of appreciation which left no uncertainty in respect to the accuracy of her condition. A measure, it must be confessed, of fascination belongs to the therapeutic value of thyroid treatment. There is the rapidity of action which follows its use; there are its far-reaching effects, accomplished by means so apparently simple, as would probably have astounded the multi-drug prescribing physicians of old. In the case of many a poor overworn patient, depressed and ailing, unfitted for work, from whom the joy of life has temporarily passed, the extract of thyroid proves a veritable elixir of life. But while reaping the gratification which springs from the benefits it confers no doubt the patient wonders, with full reason, how so trivial a thing as a small tablet, neither drug nor chemical, should possess the power for good it displays. And so of the many great advances of modern medicine I believe the evolution of our knowledge of the protean effects of hypothyroidism and of its treatment by thyroid extract to be one, at least, of the greatest. What is true of the therapeutic value of thyroid extract in the treatment of keratitis punctata is equally true of that large class of cases of ulceration of the cornea among the poor, the cause of which is generally attributed to "debility." Among these are included the cases which in olden days would have been described as "strumous ophthalmia." Nowadays the term "strumous" has ceased to be officially recognised; persons, the victims of active tubercle, are now not strumous but tuberculous; persons who look "strumous" now emphasise the general signs of hypothyroidism, in more or less degree, and these signs vanish under thyroid treatment.

Attention may now be drawn to a further aspect from which metabolic toxæmia affecting the ciliary body may be considered. First, it may be said that the term "vicious circle" is applicable to cases of metabolic toxæmia. There is the primary stage, represented by auto-intoxication, arising as we may assume, in the intestines. To combat the toxæmia so-called, the thyroid gland, through its secretion, is called upon to make strenuous efforts under the influence of excessive stimulation. For a time these efforts are successful. Later on, however, the thyroid fails in its mission. Then follows the second stage—namely, hypothyroidism. With this begins a pervading uncontrolled toxæmia. Accompanying this, and dependent upon it, is the last stage—that of diminished resistance of the tissues, thus rendering them a prey to bacillary infection. The difficulty, however, of these cases lies in the absence, oftentimes, of any cause of the toxæmia and of the hypothyroidism which is present. In the case of "K. P." the signs of hypothyroidism are so well marked that the existence of some source of toxæmia is at once suspected. But while it is impossible to believe that any toxæmic condition could fail to depress the action of the thyroid, the fact remains that the hypothyroid effect is not always actively marked—for example, a case comes under observation of irido-cyclitis, the cause of which is due to alveolar pyorrhœa. Here the source of the toxæmia is evident. On the other hand, the hypothyroid effects are commonly but little noticeable, or even, it may be, are absent. In former days the toxæmic source of these cases

was overlooked. They were classed under the generic name of "rheumatic," and rebellious to treatment they proved upon the basis of their rheumatic origin. The perversion of metabolism, however, which establishes an irido-cyclitis in alveolar pyorrhœa, is also responsible for the disease in other forms of auto-intoxication. Hence the term "rheumatic" now conveys no etiological significance beyond implying that the attack of irido-cyclitis is of toxæmic origin. There is held to be some association between these attacks and so-called gonorrhœal rheumatism, inasmuch as in such cases a common history is that of a previous gonorrhœal infection. But the term rheumatism suffixed to gonorrhœa is merely a term, and in these days might with advantage be improved upon. The signs of so-called gonorrhœal rheumatism may be symptomatic of rheumatism. But, on the other hand, these signs are probably due to a paragonorrhœal toxin, as distinct from that present in a pure rheumatic attack, as is the toxin of tetanus from that of any other pathogenic organism.

The fact of the toxæmic origin of these cases being admitted, the assumption follows that a more or less degree of hypothyroidism is present which requires as the first line of systemic treatment the administration of thyroid extract. A striking instance of the efficacy of this method was in that of a man suffering from a third attack of so-called rheumatic irido-cyclitis. The signs were acute, the eye was intensely painful. Three grains of the extract were ordered twice daily. After taking the third tabloid all the pain ceased, and yet the severity of the pain was such as to indicate relief by leeching.

Metabolic toxæmia, I believe, bears closely upon another form of irido-cyclitis—namely, that associated with the acute parenchymatous keratitis of inherited syphilis. Congenital syphilis is a disease of very varying virulence. The many eccentricities which distinguish its mode of transmission find their counterpart in the varying intensity of its incidence. An infant may be grossly syphilitic at birth; then it commonly fails to survive. But while this represents the extreme effect of the hereditary transmission, on the other hand the stigmata of congenital syphilis may be so nebulously manifested as to escape notice. In these cases nothing may happen until later childhood. Then may come an attack of interstitial keratitis, which reveals the certainty of the taint. Moreover, this interstitial attack may be the only manifestation, an isolated symptom at the time, unaccompanied by any additional evidence of systemic infection. Of such cases I can recall instances which have come under my observation where deafness, disseminated choroiditis, gummata, and nodes, the common signs associated with an interstitial attack have each been absent.

The logical inference to be derived from these cases is that congenital syphilis can be at times a very benign disease, the presence of which is displayed only when some adventitious tissue environment renders its manifestations possible. The evidence of that environment is commonly shown in the children in whom acute parenchymatous keratitis develops. Frequently the general condition of the patients is more noticeable than the ocular signs of which they complain. These children are mostly wasted, pallid, feeble with malnutrition actively marked—objects of physical misery from every point of view. The stigmata of syphilis in active virulence are not here exhibited in the general condition of the patient. On the contrary, the general signs are those of metabolic toxæmia, of depressed vitality arising from hypothyroidism. As such they correspond to those to which attention has already been drawn in connexion with keratitis punctata. The view that the spirochæte becomes attenuated in virulence in the process of transmission is supported by the fact of its failure to impress upon its host the facial and other features which form the peculiar appanage of syphilitic inheritance. Whenever, therefore, these conditions prevail it may be concluded that except for the adventitious tissue environment represented by hypothyroidism, the spirochæte would be unable to exhibit the pathogenic influence which still remains to it. This assumption is borne out by clinical experience. The worst cases met with of interstitial keratitis are always those in which the signs of hypothyroidism are most pronounced. At this point some reference may be made to the widely divergent views which prevail of the nature of interstitial keratitis. By some authorities it is held that the disease is directly due to the action of the spirochæta pallida; by others that it is only, indirectly, a manifestation of syphilitic infection, and that it should be included among those of the parasyphilitic type. Elschnig believes that the disease is a degenerative one, due to disturbance of nutrition, arising from toxins circulating in the blood stream. My view, as will have been gathered from the reasons already expressed, closely accords with the latter, and it is in consequence of that view that for some years I have regarded cases of interstitial keratitis as not among those to be treated by antisyphilitic remedies. Upon this subject I may now add a few further remarks. Believing, as I do, that the pronounced objective signs of malnutrition indicate that the syphilitic manifestation is secondary to, and has only been rendered possible by, the metabolic toxæmia present, it seems entirely unscientific to treat these cases heroically by "606," and by leeching to relieve the photophobia. It may or may not be admitted that there is but little syphilis in these cases, but the fact nevertheless must be conceded that the disease is overshadowed by the evident malnutrition. Amid, therefore, the pervading diminished resistance of the tissues, the spirochæte is able to assert its presence, but in consequence of the depressed vitality the tissues are unable to respond, save feebly, to the therapeutic influence of antisyphilitic treatment. The persistent method of treating these cases, as if they were purely syphilitic, by heroic measures, has probably been accountable for the notorious repute they possess of requiring a prolonged period of treatment before convalescence is established. Thirty years ago it was commonly held that 18 months' treatment at least was requisite before cases of interstitial keratitis could be regarded as cured. This cheering information used to be imparted to the parent attending with her child for treatment. But it is true that the severity of the inflammation was much greater then than is now customary to be seen. The cornea was not infrequently wholly vascular, "salmon" colour in appearance.

The lines of treatment which I have followed for some years include beginning with 3-grain doses twice daily of thyroid extract, and locally fomentations and atropine. As the nutrition proceeds in improvement so the ocular signs diminish in severity. In a deplorably bad case of malnutrition,

a case typical of the worst form of double interstitial keratitis, a child under this treatment was fat, strong, and well at the end of three months. And there the problem remains; if interstitial keratitis be purely and wholly a syphilitic lesion, how is it curable without antisyphilitic treatment? Impartial reasoning suggests that except for the tissue environment of pronounced diminished resistance the attenuated spirochæta pallida of a benign congenital transmission would fail to exert its pathogenic influence. The possibility of this view being correct throws emphasis again upon the value of recognising the vulnerability of the ciliary body—practically the blood organ of the eye—to metabolic disturbance. It emphasises, too, the therapeutic advantages to be gained by combating such toxæmic manifestations by thyroid treatment. Moreover, in this connexion the reflection inculcated in the following quotation from a paper by Hertoghe, of Antwerp, applies with force to ophthalmic surgeons—namely, "The day is coming when we will interrogate the thyroid equation (hypo or hyper) in all our patients with the same fidelity that we inquire to-day into their previous history as regards tuberculosis, syphilis, and alcoholism." [2]

In conclusion, the main purport of this paper is to lay stress upon hypothyroidism as a causative factor in cases of irido-cyclitis and upon the usefulness, clinically, of its recognition. That the ciliary body, so sensitive to toxæmic influence, should readily respond to thyroid treatment is a natural sequence to the vascularity of its structure. Thus is placed in the hands of the ophthalmic surgeon a means of relief, yielding results which can be obtained in no other way. The dose of the extract employed by me for children beyond 5 years of age and for adults is 3 grains twice daily, and from this dosage I have never seen any ill-effects.

Wimpole-street, W.

FRACTURE OF THE PELVIS, WITH EXTRA-PERITONEAL RUPTURE OF THE BLADDER.

BY A. E. BLACKBURN, M.D. BRUX., M.R.C.S., &c.
AND
W. WARNER COOK, M.R.C.S., L.R.C.P. LOND.,

FRACTURE of the pelvis and rupture of the bladder are fairly common accidents, but the enormous separation of the pubes and the extensive damage to the bladder and prostate from such a simple cause seem to make this case unique.

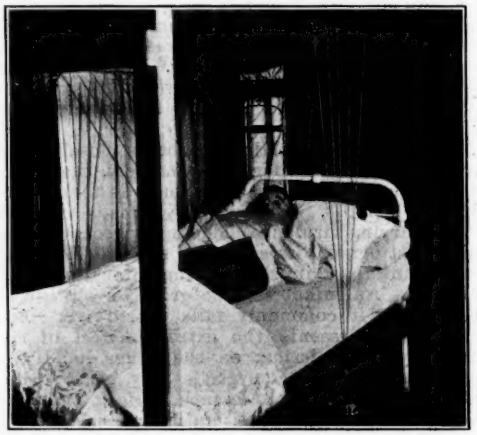
The patient was a healthy farmer aged 45 years. The accident occurred on August 5th, 1914, whilst he was engaged in showing a horse for military purposes. He jumped on to the horse bareback. At the time he felt no pain, but after riding a few yards he felt a griping sensation "inside." This became so bad that he rolled off the horse; he was found in this condition and taken home. He was quite certain that he did not jump heavily on the horse, and he was equally certain that the horse did not buck, nor crush him in any way. He was not under the influence of alcohol. He had ridden horses for years, and times out of number he had mounted horses in a similar way. The accident occurred at 6 P.M.; he was seen by us at 7 P.M. He was in great pain and his scrotum and perineum were very swollen and discoloured, and his left leg was rotated outwards.

[2] American Medicine, April, 1914, p. 198.

On first sight it appeared that the case might be a simple hæmatoma of the testis, considering the history of the accident, but as he had not passed urine for some time, and there was no bladder dulness, it was decided to pass a catheter. On passing a catheter a little bloody urine was withdrawn. It was considered advisable to remove the patient to a nursing home for operation, as his house was 10 miles from the town. He was operated upon at 1 A.M.

On making a suprapubic opening hæmorrhage was very free, and this was found to be coming from the region of the prostate, which was ripped up, along with the bladder. The rent in the bladder was so extensive that the hand could readily be passed into its cavity. The ramus of the left pubic bone was fractured near the symphysis, and the separation was over 6 inches in extent. As the hæmorrhage was so free and the patient was in such a critical condition any attempt at suture of the bladder was considered unadvisable, and he was merely packed with gauze and drainage-tubes inserted. His legs were tied together and the usual treatment for shock was carried out. He was not expected to recover. Hæmorrhage continued to be profuse for the next 24 hours, but the patient rallied and his condition next day was satisfactory.

FIG. 1.

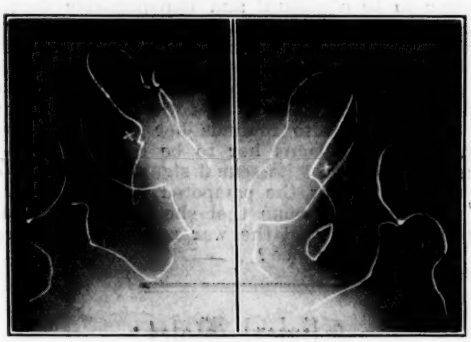


The patient lying in the leather splint. The bed is surrounded by a wooden frame, cords are fastened to the leather and passed over the top rail of the frame; at the ends of the cord on either side is a tin containing shot. The tin on the left side contains 6 lb., the right 12 lb. The patient is "slung" in the same way as one slings a horse.

On August 9th the plugs were removed, and on the 11th, under an anæsthetic, a metal catheter was passed and tied in, the bladder washed out, and Irving's apparatus applied. The bladder was washed out twice daily, and urotropin and brandy were given regularly. About this time he appeared to be developing pneumonia. The temperature went up and nasal breathing was marked, but it subsided after more frequent bladder washings. On Sept. 3rd an attempt was made to draw the pubic bones close together, and a leather splint was applied with counter-extension and weights (Trendelenburg). (See Fig. 1.) The patient had complained of great pain and could not sleep, but from the day on which this splint was used he became more comfortable. On Oct. 14th he passed urine naturally, and the suprapubic opening closed about the end of November, and he was able to stand, but this gave him pain, and he was glad to return to his splint.

On cystoscopic examination of the bladder in December, it was found to be perfectly healed, and no scarring was found. An X ray examination disclosed the fact that the bones were still about 1½ inches apart, and that the sacro-iliac joint has suffered partial dislocation; but in spite of this fact the patient is able to walk. The skiagram (Fig. 2) shows the present condition.

FIG. 2.



Skiagram of pelvis looking from behind. Left side: × shows partial dislocation of the left sacro-iliac articulation. The ilium is displaced upwards. Right side: × shows the normal position of the right sacro-iliac joint. The left os pubis is seen separated from the right; the fracture going through the symphysis, above which the coccyx appears. The bone is displaced upwards. The straight line shows the width of the separation of the pubic bones.

The case is interesting in the extensive injury produced by merely jumping on a horse, and the suggestion of congenital weakness of the pubic symphysis does not explain it. The use of the Trendelenburg splint for drawing the bones together we have not been able to find in any text-book, and are indebted to Mr. Thomson Walker for pointing it out in a French genito-urinary paper. In spite of the fact that no sutures were inserted into the bladder, it healed up perfectly, and the capacity does not appear materially altered. The patient is now pursuing his ordinary work as a farmer, walking easily for three miles at a stretch.

HYPERTRICHOSIS IN THE INSANE.

BY C. T. EWART, M.D. ABERD.,
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ANYONE with an observant eye who happens to pass through the wards of an asylum cannot help but being struck with the number of female patients showing an excessive overgrowth of hair on the face—a number much larger than can be seen in any haphazard collection of women selected from the everyday world. The overgrowth is not a mere pencilling of down on the upper lip and chin, but hirsute appendages capable of arousing in some men a feeling of envy. It would also be observed that these cases are represented by a lusty and strong type of physique, thus conveying the impression that the overgrowth is correlated with animal vigour.

At the present time there are resident at Claybury Asylum ten cases of hypertrichosis. Two of these are married—one with two children and the other childless; the remainder are single and have no offspring. Two of the single women have an abundance of hair on their lower extremities, but in the remainder the distribution of hair is normal. All have menstruated regularly, height and weight are above the average, and the type of insanity in each is that of depression. The excessive amount of hair on the face has been developed in adolescent life and not after the climacteric. All being sensitive on the subject, to please them a razor has frequently to be used. Some even endeavour to get rid of the disfigurement by rubbing with pumice-stone. No history as to hereditary transmission can be elicited.

The question as to what are the causes leading to this form of hirsutism is shrouded in mystery, but I would venture to suggest that there is evidence which goes to show that the secretions of the suprarenal glands may be important factors. Before touching on this point it would be as well to remember the advice of Dr. T. B. Hyslop: "That not only may there exist a functional increase or a diminution of one type, but also a relative or compensatory increase or diminution of the secretion of one or several of the undamaged remainder. ..... It is warrantable to assume that a lesion of any important gland makes itself felt throughout the whole of the chemical interchanges of the body." I pass on to touch briefly on some of the secretions.

Ovaries and testicles.—With the development of the sexual organs there is marked growth of hair. In women the cessation of the sexual functions at the climacteric does in some cases correspond to the excessive growth of hair on the face; but, considering that all women pass through this change and so few who suffer from hypertrichosis, the cause of the overgrowth cannot altogether depend on the secretions or lack of secretions of these glands.

Thymus gland.—This gland apparently becomes functionless about puberty, and there is at this time an increase in growth of hair. It has been suggested that it is the thymic secretion which inhibits the sexual development with its associated hair growth. Removal strikingly impairs the development of the osseous system and the genitalia.

Thyroid gland.—When there is a diminution of secretion the hair of the scalp becomes scanty and prematurely grey, with a falling off from the eyebrows, eyelashes, axillæ, and pubis. With thyroid medication the hair again grows.

Pituitary gland.—This does not appear to have any influence on the growth of hair.

Suprarenal glands.—The cortex forms, in man, at least 90 per cent. of the entire bulk of the gland, and it is the enlargement of the cortex which characterises the adrenal glands of the higher animals. They exert a powerful influence on the growth of the hair, for in a few instances hypertrophy has been associated with early sexual development of hair. On the other hand, disappearance of the pubic hair and non-development of the genital organs have occurred in connexion with defective suprarenals. Dr. T. R. Elliott, of University College Hospital, states: "The cells of the cortex are derived from a mass of tissue close to the kidneys in the neighbourhood where the sex gland arises. As the latter, testis or ovary, descends to the pelvis, it carries with it buds from this mass which may be scattered along the line of descent and form accessory cortical adrenals along the spermatic veins. There is reason to believe that other buds are embedded in the sex gland itself, giving rise to the lutein cells of the ovary or the interstitial cells of the testis. By these cells are determined the sexual characteristics of the individual."

Some forms of cortical overgrowth cause an early adolescence and sexual precocity. The young male acquires hair on the face and pubes years before the proper time, and his body at nine years becomes that of a diminutive but strongly built man. The female, curiously enough, under like conditions, loses the characteristics of her sex, hair growing on the face and her body assuming a masculine contour. Dr. Gordon Holmes describes a case in which a perfectly normal young woman had at the age of 20 ceased to menstruate, and this she attributed to fright. A beard commenced to grow

and the body assumed a masculine appearance. Four years later a tumour of the right adrenal was removed, but time has not yet permitted of the hoped-for result—the return to femaleness.

The medullary portion of the suprarenals has, apparently, only a very close connexion with the nerves of the sympathetic system.

From the presence of the lanugo, or down, on the human fœtus we may infer that man is descended from some animal which was born hairy and remained so during life. In the infancy of the race, and before man started to conquer the earth from the Equator to the Arctic regions, a complete covering of hair may have been a useful protection, not only from wet weather but from sudden chills. Gradually, as his brain developed and his intelligence evolved, by natural and sexual selection he cast off his hairy clothing and supplied himself with substitutes derived from the animal and vegetable worlds. Other animals find a niche in the world into which they fit themselves, rest, and are thankful, but insurgent man travels along the open road and no niche is good enough for him. This being so, he has to be capable of adapting himself to all conditions of existence, as otherwise he would have found himself in a cul-de-sac. The power ever thrusting him forward is the function we term mind, which precedes and creates for itself the structure we call body and is itself an evolutionary product. The loss of hair is thus correlated with the growth of intellect, and this may to some extent explain the baldness which is always conspicuous by its presence at the meetings of learned societies. The superman will most likely be a completely hairless creature. Darwin holds that, as the body in woman is less hairy than in man and as this character is common to all races, it is right to conclude that it was our female semi-human ancestors who were first divested of hair for some natural advantage, and that this partial loss, because it exposed the beauty of the skin, became highly esteemed as an ornament by our male progenitors, and so gradually by sexual selection the denudation proceeded. With civilised man the sense of beauty may be intimately associated with complex ideas and trains of thought, but in the great majority of animals the taste for the beautiful is confined, so far as we can judge, to the mere attraction of the opposite sex. Where females have been the selectors the males are more highly ornamental; where males exercise the right of choice the opposite occurs. In the case of woman man has decided that smooth cheeks are ornamental, and this becomes transmitted exclusively to the female offspring, and those with an overgrowth are not sought for as mates and therefore die out. Anyone who has seen pictures of the Siamese hairy family must admit that they create feelings of repulsion. The beard is peculiar to man, and because it gives an aspect of virility to the face it acts as an attraction to the woman, thus becoming a secondary sexual character, and I have yet to hear of a civilised nation which looks upon a beard in a woman as anything else but a monstrosity. It revives the old prejudice that anyone with this stigma represented a person on whom Nature had branded a mark of mental and moral degeneracy.

> But thou art neither like thy sire or dam,
> But like a foul unshapen stigmatic—
> Marked by the Destinies to be avoided
> As venom toads or lizard's dreadful stings.
> —*Henry VI.*

The evolution and maintenance of sex is definitely for the purpose of reproduction, and is ordained for the sake of the race and the future. It is an instrument of progress becoming more powerful, more delicate, and more subtle in its work as the ages roll by. This is the evidence afforded by a survey of living forms in general, and emphasises the arguments of those who say that the trend of evolution is towards an increase of sex differences, and that, if history is to be trusted, there would appear to be a natural and indispensable decree for an increase of feminism in woman and masculinity in man. But if so, what is the inner meaning of the modern mode of clean-shaven faces? Is a moustache to be doomed because it is not only a constant emblem to a woman that a man is a man, but also reminds her of the unkind fate which condemns her to be born a female? Has facial hair lost its sexual significance because of the creation by the pampered luxury of peace of a feeling in woman that she no longer needs a protector, and will the war restore a beard to its original importance?

Claybury.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTE ON A LITTLE-RECOGNISED FORM OF CARDIAC THROMBOSIS.

BY SAMUEL WEST, M.D. OXON., F.R.C.P. LOND.,
CONSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

THE common forms of cardiac thrombosis are: (1) the soft bulky gelatinous clots, described as *post-mortem clots;* and (2) the tough, more or less, decolorised clots which form the chief part of the *vegetations* on diseased portions of the endocardium, especially in connexion with the valves. As rarer forms are (3) larger and more or less *rounded masses* found in dilated cavities; they are usually attached to the cardiac walls, but may be free, when they have been called (4) *ball thrombi*. It is the pathological rarity of these two last forms that gives them their chief interest.

The form of cardiac thrombosis with which I wish to deal is of an entirely different character; it occurs in patients who have been long a-dying, as in phthisis or malignant disease. The clots present the usual characters of ante-mortem clots, being firm and tough, pale, and fibrinous. They are thin and flat and moulded to the shape of the ventricles and auricles, and represent these cavities in the stage of extreme contraction. The thickness varies in different parts, but averages one-eighth to one-quarter of an inch. The clot starts in the ventricles, behind the trabeculæ carneæ, and in the auricles among the rugosities of the appendix, and this connexion keeps them fixed. In the ventricle the clots form a thin, flat, triangular, pancake-like mass, 3 inches, it may be, in length and 1 to 2 inches in greatest breadth. A thin band may pass through the auriculo-ventricular orifice, to be continuous with a similar flat clot on the auricle, from which string-like processes may extend for some distance into the branches of the pulmonary artery and veins. Clots of this kind are, as would be expected, commonest on the right side of the heart, but they may occur on the left or on both sides together. Apart from their pathological

interest these clots are of clinical importance, because they may become detached and thus cause fatal embolism. This cause of pulmonary embolism should be borne in mind when no source for the clot can be discovered in the veins.

Embolism of the aorta might similarly occur, and a case of this kind I recorded some years ago. The patient died suddenly. The main trunk of the aorta was found plugged with a mass of tough decolorised clot of considerable size. On unravelling this in water it opened out into a thin flat clot such as I have described, which could be readily placed *in situ*, and corresponded exactly with the cavities of the left ventricle and auricle.

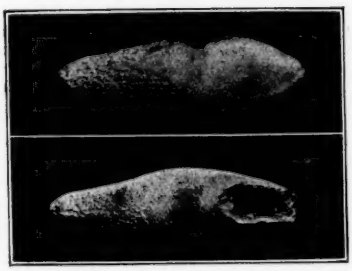
It is strange that this form of cardiac thrombosis has not received more attention, as it is by no means rare.

Wimpole-street, W.

URETHRAL CALCULUS IMPACTED FOR 15 YEARS.

BY T. BATES, JUN., M.B., B.S. LOND., F.R.C.S. ENG.

THE patient was a male, aged 39 years, unmarried. The following history was given. The patient was circumcised in 1899 at the Middlesex Hospital. In 1900 he was seized with acute pain in the penis. A small calculus became lodged in the fossa navicularis. He consulted a medical man, who prescribed some medicine for him, and shortly afterwards he left London, since which date he had consulted no medical man, although the calculus remained *in situ*. I saw him on account of severe



The calculus, exact size. The upper view shows the dorsal aspect and the lower view shows the right lateral aspect of the calculus.

pain and swelling in the penis. I then found the distal half of the penis much swollen. Thin watery pus was discharging from the urethra. There was a muco-cutaneous fistula opening behind the glans penis.

Operation.—An incision was made from the meatus urinarius to the muco-cutaneous fistula, the stone removed, and hæmorrhage controlled by catgut suture of the wound. A No. 12 bougie was passed once a week for four months as a precaution against stricture.

The stone weighs 58 grains; size $1\frac{3}{4} \times \frac{1}{2}$ in. The anterior third is smooth and blunt; the posterior two-thirds are rough and pointed. The anterior half is hollow, the walls being laminated, the inner laminæ being dark in colour and the outer ones pale.

Worcester.

THE Royal Dental Hospital, Leicester-square, has received a donation of £500 from the trustees of Smith's (Kensington Estate) Charity.

Medical Societies.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

Dermatitis Herpetiformis.—Urinary Concretions.—Cases of Landry's Paralysis, Myasthenia Gravis, and Epileptic Automatism.

A MEETING of this section was held on April 23rd, Professor J. A. LINDSAY, the President, being in the chair.

Dr. C. M. O'BRIEN showed a boy, aged 14, who had been suffering from Dermatitis Herpetiformis since he was 3 months old. He was one of a family of nine healthy children, and up to the time of vaccination was in good health. He then developed a rash, which in its early stages caused much itching, was multiform, and well marked on the arms and legs. A peculiarity was its persistence and recurrence. It never totally disappeared.—Dr. WALTER G. SMITH said the disease was rare; he suggested "dermatitis multiformis" as a better name. He considered the persistence and recurrence its distinguishing marks. He looked upon treatment as of no avail.

Dr. WALTER SMITH read a paper on Urinary Concretions, their Origin and Modes of Formation, in which the following questions were brought forward: 1. Is there any essential difference between gravel (sand) and calculus? 2. Is there any general theory of calculus formation? 3. Is there a scale of relative frequency of the different species of calculi? 4. What do we know as to the determining factors leading towards or producing calculi? 5. How far can we trace the coöperation or interaction of colloids and crystalloids in their production? 6. Has the frequency of calculi sensibly decreased within recent times. Stress was laid upon conditions of altered or perverted metabolism in the etiology of calculus, and attention was called to our ignorance of the pathology of gout and to the exaggerated statements as to the alleged pernicious effects of uric acid in the blood. The conditions relating to relative solubility were discussed in some detail, and it was insisted that the relations between colloids and crystalloids are of prime importance in the etiology of urinary concretions.—Sir JOHN MOORE recalled his experience of 40 years ago at the Meath Hospital, when the surgeons were almost constantly operating for stone. He thought the prevalence of stone had decreased in recent years. He had always connected the subsidence of ordinary calculus with the introduction of Vartry water.—Professor H. METTAM said that urinary calculi, chiefly oxalate, carbonate, or mixtures, were met with in the domesticated animals. In a specimen shown at the Section of Pathology renal calculi were found in the lymphatic spaces outside the tubules. In the lower animals calculi of enormous size were met with. It had been observed that rams fed on mangolds, which are very rich in sugar, frequently developed calculi.—Dr. A. R. PARSONS asked for an explanation of the frequent occurrence of calcium oxalate crystals in the urine of diabetics.—Professor E. J. MCWEENEY said that during the past 20 years he had examined from 50 to 60 ordinary calculi and was strongly struck by the extremely dark colour of these oxalate of lime calculi; an oxalate of lime calculus found in the pelvis of the kidney was absolutely jet black with a very polished surface. This dark pigmentation of calcium oxalate calculi might be correlated with the fact that their surfaces are so rough that they produce small hæmorrhages.—The PRESIDENT said that in his experience in the North of Ireland calculus was rare, and he thought that a decrease had come about in recent times. The decrease might be accounted for by the extreme rarity of gout, which was much more common some years ago.—Dr. SMITH replied.

The PRESIDENT read the notes of the following three cases. 1. A case of Landry's Disease. He discussed the possibility of the case being one of acute ascending myelitis, acute poliomyelitis, or acute toxic polyneuritis, but was of opinion that these conditions could be excluded, and that the case was a genuine example of Landry's syndrome. 2. A case of Myasthenia Gravis. The points of distinction between myasthenia gravis and

cases of aggravated neurasthenia were discussed, and stress was laid upon the predominance of muscle fatigue, the myasthenic reaction, the condition of the reflexes, the absence of pain, the absence of morbid introspection, and the alternating character of the symptoms as characteristic of the former disease. 3. A case of Automatism. The patient was a man, aged 60, of temperate habits and a history of good health. There was no history of hereditary nervous disease, alcoholism, or syphilis. His general health was excellent, and his weight was 14 st. 7 lb. There was no evidence of organic disease in any of the viscera. His story was that on several occasions he had found himself at considerable distances from his office without any recollection of what had happened in the interval. He had never had a convulsion, had never fallen or hurt himself, had never passed urine during an attack, and his condition had never excited the notice of any of those persons with whom he was associated. On recovering from a seizure he felt perfectly well, and there were no after phenomena. Physical examination was entirely negative. The patient was put upon a course of bromide and belladonna, and in a short time the attacks ceased. When last seen he had been free from attacks for a period of nearly five years.—Dr. H. C. DRURY considered that the first two cases were without question, but the third reminded him of a case of his own which he looked upon as of the nature of *petit mal*.—Dr. PARSONS agreed that the third case was one of *petit mal*. He recalled the case of a patient of his which ended fatally. At the necropsy nothing could be discovered wrong with the brain.—Dr. W. R. DAWSON agreed that the second case was not neurasthenia. In the third case, while listening to Professor Lindsay's account, he had made a diagnosis of *petit mal*. He considered the fact that the fits had ceased was an example of the good results produced by the combination of belladonna and bromide.—Dr. H. T. BEWLEY also discussed the first case.

The PRESIDENT, replying, agreed with the name of *petit mal* as better fitting the third case.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

"Anger."—Research in Connexion with Causation of Insanity.

THE quarterly meeting of this association was held in the rooms of the Medical Society of London on May 18th, Dr. DAVID G. THOMSON, the President, being in the chair. Dr. Thomson having referred to the services to psychological medicine of the late Sir Thomas Clouston, the meeting passed a resolution of sympathy with Sir Thomas Clouston's relatives, the members rising in their places.

The PRESIDENT also said that Dr. J. Beveridge Spence and Dr. T. Seymour Tuke had recently lost their sons in battle, and the meeting expressed its sympathy with the bereaved parents.

About 100 books were presented to the library by Dr. T. B. Hyslop, who was cordially thanked for his generous gift.

Dr. HYSLOP then read a paper on "Anger," and said that many authorities considered that Germany was now running amok in an epidemic of maniacal fury. He regarded this as an instance of epidemic psychopathy, a repetition of which humanity was not likely to permit.—The subject was discussed by Sir GEORGE SAVAGE, Mr. H. F. HAYES NEWINGTON, Dr. J. N. SERGEANT, and Mr. W. F. SAMUELS.

Dr. DAVID ORR read a paper on Research in Connexion with the Causation of Insanity. Such research in this country, he said, up to the present time had been either isolated, neglected, or starved. At one period of our knowledge isolated effort could make some headway, but now the problems were much more complex, rendering essential the coöperation of several species of workers. Research had come to mean specialisation in a branch after a thoroughly broad preliminary training, and this must be given in a properly equipped central laboratory. Such laboratory must be prepared to give instruction in anatomy, physiology, pathology, bacteriology, chemistry, and serology as applied to the nervous system. There were many examples in history of the futility of attacking problems from a narrow standpoint. Dejerine had declared that in the study of the lesions in aphasia, macroscopic observation was not sufficient; there must be microscopical examination in serial stained sections of the affected hemisphere, or even of both hemispheres. Only by this means could the limits of the lesion be determined and the questions still under debate be solved. This must apply even more truly to such conditions as various types of insanity, epilepsy, agnosia, apraxia, &c. And there must be complete reciprocity between the laboratory and the asylum. Investigators in the domain of neuro-pathology must no longer recognise any line of demarcation between the brain and the nervous system. Clinical insanity, he considered, was best taught in a clinic where the cases were seen in the stage of early development; and the clinic should be in close touch with the laboratory. Both should be conveniently near to a medical school whose teachers could give special lectures and expert advice. No training could be complete without adequate clinical instruction. Each asylum should have its own pathological department, in which those who had been trained in broad neurology could work out problems for themselves; when in difficulties the central institute could be drawn upon for expert advice. The county asylum was not the best place in which to learn, because so seldom were cases seen there in the early stage.—Mr. HAYES NEWINGTON hoped that those who would find the money for research would be impressed by what Dr. Orr had advanced; he had made out an excellent case for it.—Dr. HUBERT J. NORMAN expressed the view of many in the asylum service as to the small opportunity they received for doing any research, though they fully saw the necessity of it. To conduct this work men must have the enthusiasm for it which the author had shown.—Dr. HARVEY BAIRD spoke of the good work being done at Cardiff Mental Hospital, due largely to the keenness of the superintendent, who succeeded in impressing the borough authorities as to the need for supporting the work.

Dr. ORR replied, expressing the view that the necessary money would be forthcoming.

ROENTGEN SOCIETY.—The annual general meeting of this society will be held on Tuesday next, June 1st, at 8.15 P.M., at the Cancer Hospital, Fulham-road, S.W. The annual report and the honorary treasurer's report will be received, and a ballot will take place to chose the president, members of council, and officers for the ensuing session. The electrical and radio-therapeutic department of the hospital will be open for inspection and there will be a number of demonstrations given. Members desirous of showing new apparatus, negatives, or lantern slides are requested to communicate with the honorary secretary, Dr. Robert Knox, 7, Harley-street, London, W.

THE HENRY SAXON SNELL PRIZE.—This prize, which was founded to encourage improvements in the construction or adaptation of sanitary appliances, is awarded by the council of the Royal Sanitary Institute every third year. The prize consists of 50 guineas and a silver medal, and it will be awarded this year for an essay on Suggestions for Improvements in the Sanitary Arrangements and Appliances on Board Ship for Passengers and for Cattle. Further particulars may be obtained from the secretary of the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W.

KING'S COLLEGE: UNIVERSITY OF LONDON.—We are informed that the course of lectures by Professor Brodie on the Gases of the Blood, announced last week, will not be delivered owing to Professor Brodie's services being required for military purposes.

ASYLUM WORKERS' ASSOCIATION.—The annual meeting of this association was held on May 19th, when Sir John Jardine, K.C.I.E., M.P., presided. It was stated in the report that although the value of the association had never been more apparent, the membership had shown a decline for the year 1914.

PLAGUE IN HONG-KONG.—The Colonial Office reports 13 cases of plague, with 12 deaths, at Hong-Kong in the week ending May 22nd.

Reviews and Notices of Books.

Abdominal Operations.

By Sir BERKELEY MOYNIHAN, M.S. Lond., F.R.C.S. Eng. Third edition, revised. In two volumes, fully illustrated. Pp. 488 and 492. London and Philadelphia: W. B. Saunders Company. 1914. Price 42*s.* net.

THE field of surgery is so vast that it is now, more than at any previous time, necessary to limit the purview of any work on surgery if the study of it is to be at all thorough; and at the present time, when specialism for good or evil has assumed such an important place in modern medicine, it is more than ever essential to confine the subject within reasonable boundaries.

When the first edition of Sir Berkeley Moynihan's work on the surgery of the abdomen appeared it was generally recognised that an extremely valuable treatise had been presented to the English-speaking peoples, and one which from the originality and experience of the author should prove of the greatest value to surgeons. This, the third, edition has grown to two volumes, and when we consider the importance of the subject and the advances which are being made almost daily in this branch of surgery, we must acknowledge that there is ample reason for the enlargement of the work. Although the book is entitled "Abdominal Surgery" there are certain intentional omissions; only those abdominal operations are included which are common to the two sexes, for no gynæcological operations have been introduced. Moreover, the surgery of organs like the kidney and the bladder, which are partly intra- and partly extra-peritoneal, is omitted, and the various operations for hernia are not included. In a work such as this the author was naturally sometimes in doubt as to whether he should include a certain operation or not; and we think that Sir Berkeley Moynihan has acted wisely in including in the work only those operations which he practises himself, and a few others which are generally recognised as worthy of recognition. One remarkable fact deserves mention, and that is that no allusion is made to mechanical aids for the union of bowel or stomach; the author holds that the purpose of these aids has been served and that their interest is now only historical; as good or even better results can be obtained without them.

It is needless to discuss the whole work in detail, but we may say that in this, as in the other writings of the author, the facts are given in simple language, and he speaks with the assurance of one who knows his subject. The illustrations are numerous and clear, and the printing is all that can be desired.

The Infant: Nutrition and Management.

By ERIC PRITCHARD, M.A., M.D. Oxon., M.R.C.P. Lond.; Physician to Queen's Hospital for Children; Physician to Out-patients, City of London Hospital for Diseases of the Chest, Victoria Park, &c. London: Edward Arnold. 1914. Pp. 265. Price 3*s.* 6*d.* net.

THE subject of the nutrition and management of the infant is one which, in view of its great national importance, has within recent years received very marked attention, and large numbers of text-books and popular manuals have appeared. The vexed question of infant mortality and the methods of reducing it cannot receive too much attention, more especially from those who, like Dr. Pritchard, have devoted special practical attention to the subject. We therefore welcome the little book before us as a thoughtful, suggestive, and stimulating contribution to this matter. Although many of the views expressed in it are new and some of them heterodox, they are obviously the result of careful thought, wide experience, and a practical examination of the problems involved.

The subject of breast feeding is first dealt with, and great stress is laid upon the importance of perseverance in the attempts to secure breast feeding in spite of difficulties. Numerous practical hints are given of measures to promote a regular and satisfactory flow of milk. Some interesting observations are next given on the nutrition of the infant and on the determination of the quantitative food requirements. By means of the "test-feed" in breast-fed cases Dr. Pritchard has accumulated some striking data. He rightly points out that it is unscientific to prepare hard-and-fast tables for general application. Each case must be considered individually, since its needs depend upon the rate of growth, the work done in bodily movements, and the rate of heat loss of the particular infant. He arrives at the conclusion that the demand for food in an infant can be increased by less clothing, more air, and more exercise. The motor functions of the digestive tract and the training of nerve centres next receive attention, and some valuable suggestions are made as to the proper education of these functions and the avoidance of disturbing factors. The subject of constipation is examined in some detail, and here the importance of quantitative and qualitative defects in diet is emphasised, as well as the value of endeavours to induce regularity of habit. Dr. Pritchard inveighs strongly against the administration of purgatives and enemata, especially against the dose of castor oil so frequently given to infants in the first few hours of life, which he regards as often provocative of subsequent constipation. Some common symptoms in infancy, such as marasmus, vomiting, crying, coughs, diarrhœa, thrush, and sore buttocks, are next examined, and the rational treatment of each is considered. A chapter is devoted to a consideration of the uses of dried milk in infant feeding, of which Dr. Pritchard apparently has a high opinion. The uses of petroleum are next dealt with in detail, and some useful directions are given in regard to preparation and dosage. Other subjects considered are the causation of convulsions in infancy and the causation and treatment of rickets. The concluding chapter is devoted to a matter to which Dr. Pritchard has devoted special attention—viz., the instruction of mothers in mother-craft.

We can strongly recommend this book to the general practitioner, and especially to those concerned in the management of infant consultations or of mother-craft centres.

Text-book of Public Health.

By E. W. HOPE, M.D. Edin., D.Sc., Professor of Public Health, University of Liverpool. Eighth edition, revised and enlarged. Edinburgh: E. and S. Livingstone. Pp. 267. Price 5*s.* net.

PUBLIC health and forensic medicine used frequently to be taught at the medical schools by the same lecturer and in the same course, and a standard text-book in both branches, which served for generations of students, was the volume known as "Husband." The two subjects are now seldom thus combined in teaching, and Dr. Hope has been well advised to issue separately the portion of

"Husband's Forensic Medicine" for which he was responsible. This little volume should go a long way to meet the requirements of the medical student or the practitioner reading for the Diploma in Public Health, for whom it is intended. It is full of well-arranged information, given with the lucidity which characterises Dr. Hope's writings, and is well illustrated. The main object of the book has been kept in view throughout, and care has been taken to quote sound authorities and to draw upon the official documents and reports which govern the every-day practice of medical officers of health and school medical officers. Some of the most useful information in the volume is derived from Dr. Hope's special experience in Liverpool, and as a whole the work deals essentially with the practice of public health in large urban communities.

The new edition is well up to date in such matters as the methods for dealing with tuberculosis which have followed the National Insurance Acts, and other recent legislation and changes of administration which bear on the curriculum of instruction in public hygiene at the present day.

Zoology: An Elementary Text-book.

By A. E. SHIPLEY, D.Sc., F.R.S., Master of Christ's College, Cambridge, and E. W. MACBRIDE, D.Sc., F.R.S., Professor of Zoology at the Imperial College. Cambridge University Press. Third edition. Pp. 752. Price 12*s.* 6*d.* net.

IN view of the authoritative names of the two authors and of the fact that the present is the third edition of their useful text-book, it will hardly be expected that much criticism can be applied to this manual of zoology—that is, in the way of detection of error—though, as they tell us in the preface, the third edition is in some parts substantially altered. There are, however, a few points to which we should like to direct their attention, where some little improvement can be introduced in a succeeding edition.

For instance, in dealing with the structure of birds (p. 629) the authors write that "according to one of the best bird specialists the external characters furnish just as reliable data as the ill-known internal organs" for the classification of this group. It is not clear whether this is in effect a quotation or a mere verbal *ipse dixit* of the eminent one. In any case it is singularly at variance with fact; for it would be hard, if not impossible, to find any group of animals whose internal anatomy has been studied in greater detail or more comprehensively than has been the case with birds. There is not a bone, not a muscle, not a viscus that has not been treated of by one or more of the seven or eight zoologists who have specially dealt with these vertebrates.

In describing the skull of Chimæra the authors naturally use the term "autostylic," introduced by Professor Huxley in his well-known memoir upon the skull of Ceratodus, for the suspensory condition of the jaws. Having decided to adopt this widely used word it was unnecessary, as we think, to replace it on p. 473 by "holostylic." The disadvantage of the "type system" in treatises on zoology (which, however, it must be confessed, can hardly be avoided) is, to our mind, that it is apt to give wrong impressions while correctly stating absolute fact. Thus, the authors of the present treatise, in distinguishing between the earthworm and the leech, remark that "in leeches, unlike the condition in the earthworm, the genital pores are single and median." The student might go away with the fixed idea that this statement covers all leeches and all earthworms, which would, of course, be incorrect. As a matter of fact this danger could be easily avoided by adding after the word "earthworm" some such phrase as "but not in all genera." A slight blemish seems to us to be shown in the definition (p. 166) of the Hirudinea, where the dogmatic statement of characters is immediately followed by a definition of the suborder Acanthobdellidæ in which several of these characters are shown not to apply. This could have been avoided by the use of such a word as "generally," interspersed with the requisite liberality.

It must not be assumed from these few observations that we are not impressed by the general and dependable accuracy, and thus usefulness, of this very handy volume. We merely proffer some suggestions for the future.

Significato Bio-filosofico della Guerra.

By Dr. WILLIAM MACKENZIE. Genoa. 1915. Pp. 101. Price 2 lire.

THIS little brochure is a praiseworthy but somewhat hopeless attempt to solve by means of biological and metaphysical methods the question, "Why do the heathen rage so furiously?" The author starts with the premise that every cell has two apparent tendencies—to become more complex and more specialised—hence grades and types become evolved. The same process applies to groups, the final evolution of which is seen in national states. Further, as every organism must fight in order to exist, this applies also to states, but the author points out that the "struggle for life" does not constitute the exclusive protection of the biological edifice, it is only a mode, a partial aspect of development, the other aspect being strictly complementary and found in "collaboration," which may attain to complete denial of self for the reciprocal advantage of the organic constituents.

Nations and states, says Dr. Mackenzie, live as if they wished to become more and more "national" and at the same time more and more "dominant." The entire drama of history according to his theory consists in the undoings of one or the other tendency and in the temporary over-ridings of one over the other; the drama—that is to say, of oppressed nations, as also of crumbling empires, from whose ashes there arise again and for ever other nations and empires. The populace, or those who think they govern them, very often maintain, and in good faith, that the object of a given war resides in the affirmation or in the defence of a given right, interest, or principle; nevertheless, whatever their apparent interests or principles may be, the ultimate scope of every war, whether confessed by those responsible for it or not, must ever be the aggrandisement of the nation or state, either directly by some positive addition or indirectly by liberation from some burden or menace. The same duplex necessity of sustenance and increase which is incumbent on the smallest protozoon in its drop of water weighs equally on nations and states; peoples with their own struggles, gigantic in comparison with those of the protozoon, have no other object than to increase in space and time, although they themselves know nothing of it.

Whether Dr. Mackenzie has satisfactorily and convincingly proved his thesis must be left for the reader to judge for himself, but to help his decision we may summarise two judgments passed by the author on two contemporary students of war—

Wundt and Bergson. The former professes to find the determining factors of the present war in a "low desire for gain" and in the "diplomatic intrigues" of those who direct the conflict against his compatriots, but above all he believes that the origin of the war must be ascribed to the will of a king (now deceased) and an ambitious group of political adventurers. A strange error, comments Dr. Mackenzie, and full of suggestion is that of this learned man who during his long scientific career has been occupied with the study of psychology, and especially the psychology of peoples. How clearly the hidden will of the nation speaks through his mouth, which befogs his thought, otherwise so clear, and makes it a blind instrument of war!

But little better is the conclusion arrived at by Bergson in his well-known academical and bellicose treatise, which is justly celebrated for its elevated style. This treatise contains in substance the startling and more or less explicit assertion that the present war is above all a struggle of the material against the spiritual, and, as is natural, the illustrious philosopher finds all the spiritual on his own side and all the material on that of the enemy. With regard to this attitude Dr. Mackenzie says with truth that science and philosophy will gain more by the silence than by the publications and speeches of those scientists and philosophers who in times of difficulty for their own country, and for the whole world, make a profession of political faith, thinking to further it by biological arguments which do not fit in with any faith. Such lucubrations conduce to a single and most deplorable result—that of causing and fostering that ignorant hate among men which is the main "enemy" to be fought against.

Radiography, X Ray Therapeutics, and Radium Therapy.

By ROBERT KNOX, M.D. Edin., M.R.C.S., L.R.C.P. Lond., Honorary Radiographer, King's College Hospital; Director, Electrical and Radiotherapeutic Department, Cancer Hospital, London, &c. With 64 full-page plates and 245 illustrations in the text. London: A. and C. Black, Limited. 1915. Pp. 406. Price 25*s.* net.

THIS is the first really comprehensive volume on the whole subject of the X rays and radium that has been brought out by a British author. While we have had many similar volumes in the past they have emanated for the most part from the continent and America. This is not because British radiologists have been behind in their researches, but rather because as a class they are more content to wait until they are sure of their ground before stating their views in permanent form. As a matter of fact, a very large proportion of the writings of foreign radiologists have added little to our permanent knowledge of radiology.

In the present volume we have a very complete treatise on the present state of our knowledge; so complete and comprehensive is it that in our opinion it goes rather beyond the author's aim, "to present to the student and practitioner in as concise and as practical a form as possible the essential points in radiography and radium therapy." The beginner who attempts to get his knowledge of a subject so highly technical from this volume will find himself rather bewildered with the task before him. The book appeals more to those who have acquired their first principles and desire to increase their knowledge extensively. This applies particularly to the first chapters dealing with apparatus. A perusal of this part would leave the beginner with a sense of incompleteness; however ample it may be for those whose technical knowledge is fairly extensive, we do not think it meets the requirements of that greater number of aspiring radiologists whose attainments in this direction are of a very sketchy character. As regards the illustrations in this section, it is perhaps unfortunate at the present time that so many of them are from the catalogues of Teutonic manufacturers. Diagrams are more valuable to the student than illustrations of the finished article of one or other maker, but they require to be carefully prepared and selected. In this connexion we may instance the diagram of a centrifugal mercury interrupter on p. 17. We think the average beginner will find no little difficulty, with only this diagram before him, in understanding how this apparatus works. The same criticism applies to the section on X ray tubes and the various accessory appliances used in radiology. Fundamental principles are passed over too briefly, there are too many catalogue illustrations, and too few explanatory diagrams for a work that sets out to teach the beginner.

When we come to the practical application of the X rays in the diagnosis and treatment of injuries and diseases, we have nothing but praise for the scope of the work Methods are clearly described and the resulting plates are illustrated profusely and well. A valuable feature of the illustrations is that all are shown in duplicate, one as a negative and the other as a positive. As a radiologist almost invariably bases his opinions on the negative plates their reproduction in this form is a very decided help to the student in familiarising himself with the immediate results of his work. A very useful chapter is that on the development of the bones, showing the appearances of the epiphyses at various ages. This will be of great help in the interpretation of plates made from young subjects—a most difficult matter at times. The chapters on the examination of the thoracic, abdominal, and pelvic organs are complete and instructive. There are few who will not find here many valuable suggestions, and as this is a branch of radio-diagnosis that is bound to be increasingly important as time goes on, a study of the whole section of the work is recommended.

In the section on X ray therapeutics we find the same thoroughness displayed as in the previous part. The various forms of technique, methods of dosage, and other necessary details are supplied in a clear and concise manner. Suitable modifications are given for the treatment of different diseases, and numerous illustrations show the effects produced after treatment by the X rays, some of the cases of inoperable malignant disease being improved in a remarkable manner.

The last part of the book deals with the physics and application of the rays from radium in the treatment of disease, the section on physics having been contributed by Mr. C. E. S. Phillips. This part of the work will be found a valuable guide.

The book, which has been printed and published in an excellent manner, is bound to achieve success.

A System of Veterinary Medicine.

By Various Writers. Edited by E. WALLIS HOARE, F.R.C.V.S. Vol. II.: General Diseases; Parasites. London: Baillière, Tindall, and Cox. 1915. Pp. xx. + 1600. Price of the two volumes 50*s.* complete.

IT is many years since an authoritative work on veterinary medicine was produced in the British Isles, and since that time great advance has been made in the science. Many a practitioner in

veterinary medicine has felt for some time that his own knowledge, limited as it necessarily must be by his opportunities, was still ahead of that supplied by the text-books, and that he could gain little progressive information from a perusal of their pages. It was somewhat of a reproach that no really good and recent standard British work of reference existed to guide, influence, and advance the knowledge of the veterinary surgeon. The reproach began to disappear when Mr. Hoare's System was issued. The information thus supplied to the veterinary profession has been derived from numerous sources, is presented in plain language, has been furnished by many of the best minds in the veterinary profession, and supervised by an editor who stands high as a clinician and scientific observer.

The first volume of the "System of Veterinary Medicine," it may be remembered, dealt with the "Microbial Diseases" of the various animals. The second deals with "General Diseases." Here the diseases described are, with few exceptions, those frequently found in this country—those, indeed, occurring almost daily among animal patients. All the contributors, 15 in number, are specialists in their several domains and have had extensive experience in treating the diseases of the horse, cow, sheep, pig, dog, cat, bird, and goat, upon which they write.

The editor writes on the diseases of the digestive system in the horse. His communications to the veterinary periodicals are evidence that he has spent years of study and research in trying to simplify some of the difficulties of diagnosis which here present themselves, and to suggest lines of rational treatment. He has, we think, succeeded in producing an admirable exposition of the subject. The ailments of the alimentary system in the other animals are also comprehensively and adequately dealt with, a special word of praise being due to the authors of the articles in this section on the ox (Mr. H. Begg, F.R.C.V.S.), the dog (Mr. E. Wallis Hoare, F.R.C.V.S.), and the pig (Mr. G. Mayall, M.R.C.V.S.). The division of the digestive ailments in the ox is good, and the treatments advised are uncomplicated and likely to be profitable and effective. The consideration of diseases of the digestive system in the pig fill a gap too frequently noticeable in books on this animal. A good knowledge of feeding, hygiene, and the physiology of digestion in porcines will be profitable alike to the professional adviser, the breeder, and the owner. The various forms of respiratory, urinary, circulatory, nervous, and parasitic disease receive full notice, and the work concludes with a section on poisons, and an appendix on the disease of sheep called "scrapie."

We have here a store of information, indispensable alike to veterinarians and students of comparative pathology. The contributions are from trustworthy sources and the book is well arranged. The publishers also have done their work well.

JOURNALS AND MAGAZINES.

The Journal of Comparative Pathology and Therapeutics. Vol. XXVIII., Part I. March, 1915.—In the March number, which is the last number of this valuable journal to reach our hands, there is abundant evidence that good work is being done by the veterinary profession. Captain E. Clive Webb, A.V.C., F.R.C.V.S., gives some results of Transmission Experiments and Arsenical Treatment of Trypanosomiasis of Donkeys and Mules in the Anglo-Egyptian Sudan, from which he concludes that arsenic appears to have a specific trypanocidal action in a large percentage of cases and clears the blood of trypanosomes. He believes that he may claim about 45 per cent. of cures, but justly observes that this claim cannot be made good until the cases have been under observation for a longer period. He maintains that to obtain successful results one must be prepared for casualties due to susceptibility and overdosage.—H. R. Seddon, B.V.Sc., of the Veterinary Research Institute, University of Melbourne, describes some observations on the methods of using the agglutination test in the diagnosis of the disease in bovines caused by the bacillus of contagious abortion. He uses vaginal or uterine exudates or the fluids from the fœtus or fœtal membranes, blood serum, or milk. He gives an account of the technique employed, describes the quantitative factors in the agglutination reaction, and comes to the conclusion that the method is of distinct value in making a diagnosis.—Principal Mettam, M.R.C.V.S., B.Sc., Royal Veterinary College of Ireland, Dublin, describes a case of lympho-sarcoma in the horse with arterio-sclerotic changes in the heart and lungs, a case of arterial sclerosis in a dog, two different malignant growths in the same dog, and an embryoma of the brain of the horse.—H. L. Watson-Wemyss, F.R.C.P. Edin., gives a sound summary of recent work on vitamines, especially in relation to beri-beri, the scurvy groups of diseases, pellagra, rickets, and tetany, and also on vitamines in their relation to growth, and calls special attention to von Noorden's oatmeal treatment of diabetes.—C. M. Wenyon, M.B., B.S., B.Sc. Lond, Director of Research in the Tropics to the Wellcome Bureau of Scientific Research, writes on the organisms found in piroplasmosis of Rhodesian sheep as observed by Bevan.—J. A. Griffiths, M.R.C.V.S., Department of Agriculture, Veterinary Division, Zomba, Nyasaland Protectorate, gives an account of Demodectic Mange of domestic animals in Nyasaland, and maintains that it is not economical to endanger the animals of the community by prolonging the life of infecting subjects, but that where treatment is considered desirable every possible precaution should be taken to prevent the disease spreading either by direct contact or through the medium of contaminated articles likely to come in contact with healthy animals.—A. Leslie Sheather, B.Sc., M.R.C.V.S., Research Laboratory, Royal Veterinary College, London, describes an improved method for the detection of mange acari dependent on the fact that these acari can be subjected to boiling caustic liquids without undergoing any outward alteration.—The general articles conclude with a revised check list of the animal parasites of domesticated animals in India by S. H. Gaiger, M.R.C.V.S., Indian Civil Veterinary Department, a list that from its size should be fairly complete. Several useful abstracts complete a most interesting number.

Dental Record.—The April and May issues of this journal contain a paper by Mr. J. F. Colyer on Dento-Alveolar Abscess and Dental Cyst. The paper is founded on a museum demonstration given at the Royal College of Surgeons last October, and forms an illustrated account of many of the specimens in the Odontological Section of the museum. The author shows that sepsis around the roots of the deciduous molars frequently involves the developing premolars, and in some cases leads to necrosis of those teeth. Some instructive specimens of palatal abscess are described, and attention is drawn to the large destruction of bone caused by these abscesses. The morbid anatomy of dental cysts is fully described, and illustrations are given of cases in which these swellings have encroached upon the antral cavity. There are over 50 illustrations.—In the May issue Mr. J. H. Mummery gives an account of his recent researches on tubular enamel, and comes to the conclusion that calcification commences in the prisms and then proceeds in the interprismatic material, and that the tubes run between the prisms and not in the centre of the prisms.—In both issues there are papers by R. Eckermann, of Malmö, on the etiology of caries.

MEASLES AT ST. AUSTELL.—At a recent meeting of the St. Austell rural district council it was decided to put into force the order of the Local Government Board for the notification of the first case of measles in every house. The medical officer of health has reported the continued prevalence of measles in the district.

THE LANCET.

LONDON: SATURDAY, MAY 29, 1915.

The Question of Conscription.

THE date of the statutory or religious holidays is very usually one against which we set in order our private affairs; and, whether we wish it or not, it is a date by which our attitude towards public matters is regularised. Instinctively we propose that one thing shall be done before the holidays, or that another thing shall be put off until after the holidays, and thus a great arrangement of business in an undefined and informal way goes on throughout the country round about these days of festival. The result is to find many people entering upon their work with renewed ardour after the holidays, not so much because they are physically refreshed, but because, in common phrase, they know "where they are." Whitsuntide found not only this country but the whole civilised world engaged in a contest of a sort that did not allow of this or that being put through hurriedly in order to get rid of the trouble by a certain date; still less do the conditions of war permit of any proceeding which is recognised as necessary being relegated to the future, however near; therefore it is in the nature of a coincidence that during the Whitsuntide holidays there should have occurred in the conduct of the war much the same kind of altered demeanour that characterises careful tradesmen who have estimated their commercial position upon the information gathered from a holiday stock-taking. And the coincidence has its value: it is a fact that the mind of the people has been prepared by the holidays for great alterations. Undoubtedly the nation is realising far better than hitherto "where we are." There has been of necessity a reviewing of the immense and terrible situation, and it is quite certain that the temper with which the war is to be carried on will now change in this country in a way that may surprise us all. There will be with us a more coherent idea as to the task that is before us and a more distinct apprehension of how the various calls on the national spirit and resources should be met. And the outcome of this change may be conscription, a measure of great medical significance in the circumstances.

Until quite recently there prevailed in this country a general and vague optimism. We remained under the influence of financial quidnuncs who said that the war could not last longer than the summer of 1915 because credits would be exhausted and supplies would not be forthcoming. Fortunately for the Allies no particular heed was paid to these prognostications, and preparations for a prolonged struggle were put in hand, though it is open to question whether they were undertaken with quite the necessary vigour—for which falling away from a strenuous ideal the said quidnuncs have to bear at least part of the blame. We were told, moreover, that the central European empires, cut off by our fleet from intercourse with the world, and suffering notably in East Prussia from interference with agricultural activities, would cease to produce the food-stuffs necessary for the support of the population, especially in view of the large waste which always occurs in time of war. No one who read the article published in THE LANCET upon the German reserves of food and their maintenance,[1] could have failed to gather that to speak of grave shortage of food-stuffs in Germany was quite premature. The possible position in Germany, in the case of British interference in the war, had been envisaged long ago by our enemy; precautions had been taken with the vigour and particularity that characterises all the German public actions, and we now know that the people who expected to find Germany hungry by the summer of 1915 were as wrong as those who expected to find her bankrupt at the same date. Gradually these things have been dawning upon the public, and it is very interesting to see how infectious the process of thought is. Within a very short space of time the public, which had so relied upon the optimistic prophecies of experts, passed into an unnecessary phase of gloom in which the resources of the Germans and Austrians appeared to be illimitable. Many of the journals of the country then began to represent this change of temper, and a deeper feeling of apprehension was produced which in some measure was as illogical as the previous attitude, based although that may have been upon ignorance. For while it is clear that the aggressive tactics which have marked our conduct of the recent stages of the war have not produced results commensurate with expectation, it is equally certain that the enemy must be far more disappointed with the position. And in one area the tide ran definitely against our cause; a great feeling of nervousness was produced, and the Government took stock of the situation. The result has been, we think, the production of the salutary impression that we must not deceive ourselves and the formation of a new administration representing the united will of a resolute people. Where we have been right we shall continue, and where we have been wrong we shall revise. Exactly at this moment, a moment which had been closely forecast by many, Italy enters the arena, marking a definite step in the progress of the war at the moment when our national temper required stiffening. It has compelled that rearrangement of ideas which is so particularly fitting to the holiday season. We see that attempts to make scapegoats for past blunders are not only ill-judged, but tragically wasteful of time; we fix our gaze on the future.

Medical men are perpetually engaged in clinical struggles where victory goes in the end to the therapeutists who, following now one indication and

[1] THE LANCET, Feb. 20th (p. 389), 1915.

now another, may commit faults in technique. What, then, are most to be dreaded are futile recriminations; what, then, are most to be desired are a calm review of the position and reinforcement from expert advice. A section of the public are apparently willing to abuse those who have the charge of the conduct of the war on evidence of whose value they can know but little. We hope and believe that this unworthy tendency will die down, and that the example of Italy, which has thrown in its lot with the Allies in perfect knowledge that failure connotes national ruin, will strengthen, if this be needed, our determination to do all to bring this war to a speedy conclusion. How can we best show our Allies, who are aware at what cost and with what devotion we have already supported the common cause, that our future undertakings will be still larger, and will reflect more surely our dour decision to win? We have a new spirit upon us, and while on the one hand it should lead to an increased production of munitions, it is not so certain that it will increase our voluntary levies of men. The populace is waiting, we believe, to be released from the responsibility of initiative. Our military authorities think that it is absolutely necessary that we should have in training further large numbers of men to take the place of the heavy depletions which we cannot but expect. The remedy is surely some form of conscription, and with this procedure a medical journal would have no difficulty in finding itself in accord. We believe that some form of conscription would be for the good of this country at the present moment, and would serve both its mental and its physical health. No one knows better than the general practitioner how unequally the call for men to the colours has been responded to in different localities and among different classes. His peculiar knowledge of the population enables him to say for certain of any locality that some in it have gone to the war, quite enthusiastically, who should have formed the material for later drafts; and that others are still outside the army, when the army needs them, when they would make good stuff within its organisation, and when all that is required to secure their adhesion is to provide the method of making up their minds for them. Conscription would find strong support in the medical profession if it is advanced as a desirable measure in the existing circumstances.

Flies and the Spread of Disease.

THE subject of spread of disease through the agency of flies has of late years met with a good deal of attention, and at the present time deserves careful consideration on account of the existence of a very large number of encampments in all parts of the country. Under the conditions of camp life in hot weather the influence of fly prevalence on the health of the occupants may be most important. If it is particularly with regard to the spread of typhus fever, enteric fever, and cholera that flies have been found to play an important part, it must not be forgotten that many other infections are disseminated by them, and that we do not really know the scope of their influence for ill. To the inhabitants not only of our own country but of the greater part of Europe the conveyance of disease by flies is for this coming summer a matter of very great moment. Every large European nation is more or less under arms, and the aggregation of huge bodies of troops in more or less temporary quarters inevitably brings about a state of things which encourages an increase of flies. The medical authorities in charge of encampments are well aware of the danger, and are not likely, in this country, to be careless in their measures against fly multiplication.

So far good. But for the ordinary town dweller special supervision and instruction as to his duty to his neighbour, as well as to his own household, may probably be advisable. The medical officer of health of Bermondsey carried on a systematic campaign against flies last year. A register was kept of all places where manure heaps or rubbish accumulations existed; about 20,000 handbills were distributed to householders, and posters were exhibited throughout the borough, explaining to the public what the danger was and what should be done to prevent it. Such a campaign might, we think, be instituted with advantage throughout the kingdom; in every camp where men are aggregated together in large numbers, with sanitary arrangements more or less temporary in character, steps should be taken to obviate the danger. The two main points to be kept in view are: (1) the removal of all rubbish, decomposing organic matter of any kind, and especially of excreta, from the immediate neighbourhood of the house or camp; and (2) the extermination, as far as may be possible, of flies of all kinds. With regard to the first consideration, in towns and places having a sewerage system there is no difficulty as regards immediate and complete removal of excreta and liquid refuse. Solid organic house refuse, which cannot be thrown into the drain, must be kept in covered receptacles and removed at frequent intervals. This is done by the local authority. Nevertheless, accumulations of manure and refuse heaps do exist, often uncovered, and are allowed to lie for days, forming breeding grounds for flies. Flies will not be attracted to a place, either indoors or out of doors, unless they find something to feed on. Of course, all articles of food likely to attract flies should be kept covered up, or within a properly protected and ventilated safe. The second point, the extermination of flies, presents several difficulties; but the principle to go upon is that of *obsta principiis*. The killing of adult flies, even in thousands, will not be sufficient; one must search for and destroy the eggs. If the campaign is taken in hand early enough in the season, flies that have survived from last year will also be dealt with.

The valuable reports issued by the medical officer to the Local Government Board during recent years should be in every hand, for all are interested in the matter of disease propagation by flies. Special reference may be made to Mr. J. P. JEPSON'S report on the breeding of the house-fly during the winter (New Series, No. 5; also Nos. 85 and 102 by Dr. S. M. COPEMAN); reports by several observers on the distribution of bacteria by artificially infected flies (Nos. 40, 53, and 66); and the reports on the range of flight of flies (Nos. 53 and 85). Professor A. E. SHIPLEY states that house-flies usually begin to breed in June and July, and continue until October, being most active in August and September; but in warm stables or kitchens they may breed all the year round. The whole development of the fly, from egg to imago, may take place in nine or ten days; the second generation may lay eggs ten days later. We hope that the interesting Anti-fly Exhibition now being held at the Zoological Gardens, Regent's Park, London, a brief account of which appears elsewhere, will be visited by many responsible members of the public, who will thus be able to appreciate the measure of risk which a community runs through the evil-doing of flies, and will be prepared to second the efforts of our sanitarians to fight a very numerous and determined foe.

Annotations.

"Ne quid nimis."

THE IMMATURE SPIRITS (RESTRICTION) BILL AND MEDICINES.

AS reported in our Parliamentary columns last week, the Chancellor of the Exchequer (Mr. Lloyd George) agreed to exempt rectified spirits used for the compounding of medicines from the provisions of this Bill. Representations on the subject were made by Mr. Glyn-Jones, M.P., Parliamentary Secretary of the Pharmaceutical Society of Great Britain, Mr. W. J. Uglow Woolcock, Secretary and Registrar of that Society, and Dr. Alfred Cox, Medical Secretary of the British Medical Association. As Mr. Glyn-Jones pointed out in Parliament, if medical men, pharmacists, and hospitals were not to be allowed to obtain rectified spirit by a prohibition clause in the Bill the position would become serious. The Pharmaceutical Society at once realised the situation, and urged that it is vital to the preparation of medicines that rectified spirits of wine should be available for use by registered medical men, hospitals, and pharmacists for the making of preparations of the British Pharmacopœia. In the recently published (1914) edition of the Pharmacopœia there are 427 preparations, and of these rectified spirit is a necessary ingredient in 263. Further, as the law stands it is absolutely illegal for anybody to make these preparations with anything but rectified spirits of wine. Subsequently general resolutions were passed, but the remissions did not appear because, as Mr. Lloyd George explained, it was not necessary to have a resolution for that purpose, all these matters, he added, being dealt with after the "charging resolution" had been adopted. Mr. Glyn-Jones was anxious that this matter should be made quite clear when the general provisions of the Bill were discussed, for as the resolutions stood they included all spirits. Mr. Lloyd George stated that it was the intention of the Government to exempt from these particular taxes the spirits used in medicine. The medical and pharmaceutical authorities, who strongly appealed for the exemption of spirit employed for medicinal purposes from the provisions of the Bill, have done excellent service to medicine by preserving the efficiency of dispensing practice in the directions indicated.

EGYPTIAN OBSTETRICS AS ILLUSTRATED BY A GREEK INSCRIPTION.

IT is popularly believed that the process of child-birth among primitive peoples is a simple and comparatively painless one. There are signs that this is so, for some of the West African women at the present time make no ado whatever during parturition, all the circumstances being normal. But a difficult labour is a different matter, and if the assistance of a native doctor is called in the fate of the mother may be a terrible one. Where the knowledge of anatomy and medicine is very small the sufferings at complicated childbirth have always been terrible, and for many centuries they were just as great in Egypt and Greece, the most civilised countries of their day, as in the backward parts of Asia and Africa at the present time. A Greek inscription recently found in Egypt clearly illustrates this sad fact in the history of civilisation. It has been published by Professor G. Arvanitakis in the *Bulletin* of the Archæological Society of Alexandria, whose edition of the text may be thus rendered into English. "Who is the dead one? Herois. How and where? Having a tumour (ὄγκος) in the stomach. And, notwithstanding that we placed a weight (in the form) of Isis; the mother was lost very quickly, and then the child also. What was her age? Eighteen. So Herois was in the flower of her age. Oh, the unfortunate one. May Osiris render her ashes light and grant her sweet water." The story told in this record is one which, it is to be feared, was of frequent occurrence about the commencement of our era. Herois's first accouchement had arrived, and the doctor, or midwife, acting as attendant, finding the delivery delayed, proceeded by mechanical means to accelerate matters. He took a weight made in the form of a figure of Isis, a presiding deity on such occasions, and either placed it upon the mother's abdomen or, as is more probable, attached it by a cord to the already projecting part of the infant. In this case the mother would have been placed in a sitting posture, resting upon two stools, or standing erect. The erroneous practice in the case referred to produced the delivery of the child, doubtless injured, for it died shortly after the mother. The word translated tumour is ὄγκος, which Galen uses solely with that meaning.

PANCREATIC INFANTILISM.

"THE characters of pancreatic infantilism are: arrested bodily and arrested sexual development; intelligence good, no mental defect; no deformity or structural defects of the bones; no visceral disease or derangement except chronic diarrhœa, flatulent distension of the abdomen, and defective or arrested pancreatic secretion. The defective or arrested pancreatic secretion is probably due to chronic pancreatitis. In some cases the condition (chronic diarrhœa and infantilism) is completely

cured by the administration of pancreatic extract and by that treatment alone." In these words Dr. Byrom Bramwell defines the condition to which he draws attention in the *Edinburgh Medical Journal* for May. It appears to be extremely rare, although cases of arrested development associated with, and apparently due to, chronic diarrhœa are not so uncommon, but in these cases there is usually no evidence of defective pancreatic secretion. Dr. Bramwell records details of his case, which has been under observation off and on for 14 years, and has done excellently on pancreatic extract. He notes from the literature also four other cases, in all of which pancreatic extract gave most satisfactory results. It appears that there is also a type of disease, termed intestinal infantilism (Herter), which may simulate this pancreatic type, but in these cases there may be associated conditions such as anæmia and splenic enlargement, whilst in one case referred to there were gastric dilatation and severe gastric tetany. The indication of the true pancreatic infantilism appears to be found not only from careful tests, of which Sahli's appears to be particularly favoured by Dr. Bramwell, but apparently also by observing the effect of pancreatic treatment.

ATMOSPHERIC POLLUTION: INVESTIGATIONS IN MANCHESTER.

WE have received a copy of the first annual report of the Air Pollution Advisory Board of the Manchester City Council, from which it appears that the question is going to receive promptly a very thoroughgoing investigation in that city. In fact, the work of this board represents a very spirited attempt to deal with the problems of smoke abatement on new lines. In the monthly reports published in THE LANCET of investigations on the nature and amount of soot-fall those made by the authorities at Manchester have already been recorded, but their inquiries are about to be extended. Thus, in addition to soot-fall observations, actinometric and photometric methods have been tried, and also an air-filter. Systematic observations have been made by the use of (1) an iodine actinometer; (2) a photographic recording actinometer; and (3) a photometer for measuring daylight. Reference is made in the report to the soot-gauge returns published in THE LANCET. "They prove," the report states, "that for the month of October the total air pollution is less at Manchester than at Oldham, Birmingham, London, Sheffield, and Bolton, Oldham being much the dirtiest place. All of them contrast most unfavourably with Malvern, Oldham having about 28 times as much soot and tar as Malvern." The comparison in regard to Manchester and London is based on the results obtained at the Embankment station of the latter city, which has nearly always shown a much worse state of affairs than the other seven London stations. This evil condition is probably due to smoke from the river and railways. The comparison is hardly a fair one to use, therefore, in a broad generalisation. We are glad to see the progress that is being made towards carrying out systematic and scientific investigation of the atmospheric pollution created by smoke, and it is to be hoped that Manchester's fine example will be followed by other cities and towns. We are particularly gratified at the success of the movement since we took a large and active share in initiating it, and have from the beginning published the returns made in the monthly records.

THE CAUSATION OF GINGIVITIS.

GINGIVITIS, or inflammation of the gums, is most familiar in its chronic form, pyorrhœa alveolaris. Since attention was first directed to it the number of general medical and even surgical conditions which are held to claim oral sepsis as a leading etiological factor is very large; it appears to share with the large intestine the unenviable reputation of being a sort of slow poisoner through the machinations of the organisms it harbours. But whilst conditions in the colon can with difficulty be accurately investigated, the mouth affords readier access for this purpose, and sufficient facts have been adduced, we think, to make the physician very willing to seek the aid of the odontologist when faced with certain chronic conditions of probable infective origin. We know that the orthopædic surgeon has already appreciated the significance of oral sepsis in its relation to some arthritic states. It is probable, however, that, in turn, the physician may help the dentist, and this more especially in coming to a decision as to what is, after all, the essential problem—namely, the cause of the pyorrhœa. He may do so in two ways. First, gingivitis is a recognised sequela or symptom in certain general diseases. Some cases of secondary anæmia, for instance, lead to pyorrhœa by inducing an anæmic and flabby condition of the gums, and predisposing in this way to the entrance of organisms. In many cases of leukæmia gingivitis occurs; in measles similarly. Lead poisoning in its less marked forms may give a key to the true cause of an inflammatory or unhealthy condition of the gums, even in absence of the characteristic blue line. Scurvy, too, a primary blood condition, leads to changes in the gums. Secondly, it seems possible that gingivitis may follow dietetic errors. A recognition of such possible causes of lowered vitality, either general or local, is of much value. Generalised periodontal disease begins in a marginal gingivitis, and many dental pathologists consider that the latter condition is due to the formation of stagnant areas around the teeth. Dr. R. Ackerley, in an interesting communication,[1] considers that the main factors in producing the gingivitis are: (1) a chronic hyperæmia due to the habit of taking food and drink hotter than the body; (2) a chronic congestion of the mouth, throat, and nose due to hyperæmia of the stomach from overfeeding and too frequent feeding; and (3) the effect on the mucous membrane of the oro-pharynx of moist, warm, unwholesome, microbe-laden air. He states that he has seen several patients with considerable chronic gingivitis who were not mouth-breathers and who kept their teeth scrupulously clean, but who, on the other hand, were addicted to taking hot drinks. With the abandonment of the hot drinks he has found a marked improvement in the condition of the mouth. These observations emphasise the importance of the influences which certain foods, and the manner of eating them, exert upon the gums. Dryness of the mouth, induced by mouth breathing, leads to lowered vitality, as does also the sustained, chronic congestion of the gums caused by frequent drinking of too hot fluids, either in infancy or even in adults. In the former, such congestion may itself lead to mouth breathing. Of benefit are foods which demand considerable "gum exercise" or the act of sucking. Fat mixed

[1] Proceedings of the Royal Society of Medicine, Odontological Section, vol. viii., No. 2.

with carbohydrates is to be deprecated because it makes a slimy film over the teeth, preventing efficient chewing. These are only some of the suggestions which a study of the mechanical value of certain foodstuffs offers. It would be of interest to follow up the possibilities of the effect of diet upon the gums. It is possible that a reversion to simpler fare or simpler cooking in certain directions may be found to result in general improvement in health, due not only to its effect upon the lower alimentary tract, but also to its improvement of the condition of the gums.

THE SPECIFIC GRAVITY OF THE HUMAN BODY.

THE specific gravity of the fluids and tissues of the body is one of the commonplaces of physiological data. The specific gravity of the body as a whole, important though it is in connexion with the power of the human body to float in water, is one which has received less attention, at any rate, in recent years. An interesting paper by Dr. C. D. Spivak, of Denver, dealing with this subject was published in a recent issue of the *Archives of Internal Medicine*. The earliest record of observations on the specific gravity of the human body which Dr. Spivak has been able to discover is that by John Robertson, librarian of the Royal Society, published in the Philosophical Transactions of 1814. Mr. Robertson undertook his experiments from the desire to know what quantity of timber would suffice to keep a man afloat in water, on the supposition that most men were heavier than river water. But his experiments showed that all the men he examined, except the first one, were lighter than an equal bulk of fresh water. Dr. Spivak has employed an ingeniously constructed tank with a gauge graduated in centimetres and millimetres to read off the level of the water within it. The individual to be examined enters the tank, and the level of the water is read before and after the immersion. The gauge was carefully calibrated in regard to the level of the water within it; the weight of water displaced by the individual could thus be determined easily. Dr. Spivak has also employed his method to determine the weight of the different parts of the body, reading off the level when the individual is immersed to the knees, to the arch of the pubic bone, and so on. In the case of a gain in weight he is therefore able to determine to what part of the body the gain has accrued. Dr. Spivak has taken the volumetric measurements of 14 individuals—namely, 4 adults, 3 males and 1 female, and 10 boys. The ages ranged from 53 years to 8 years, the weights from 79 to 26 kilogrammes, and the heights from 1·71 to 1·35 metres. All the measurements were taken at 7 P.M. before the evening meal. The specific gravity of the entire body varied between 0·976 and 1·049. The average specific gravity of the adults was 1·003 and of the boys 1·006, the average of all the individuals examined being 1·005. The other observations on record are according to Dr. Spivak either too low, such as those of Robertson, 0·8706; Suelzer, 0·970; Herman, 0·920; or too high, such as those of Krause, 1·055; Ziegelroth, 1·055; Miess, 1·012; Meeh, 1·012. Dr. Spivak maintains that his tank being of smaller diameter than any of the vessels hitherto used, is designed to get more accurate results than those of his predecessors. The difficulty introduced by the amount of air in the lungs is discussed by Dr. Spivak, together with the means of overcoming it.

THE NATIONAL INSURANCE ACT: THE REDUCTION OF CAPITATION FEES.

THE proposed reduction of quarterly advanced payments to practitioners on the panel formed a prominent subject of discussion at a conference at Chesterfield recently, a strong point being made as to the lack of evidence to justify the scale of reduction proposed. It was urged that this amounted to over 40 per cent., whereas the estimates of the Approved Societies with regard to enlistment pointed to an average of 12 per cent. withdrawn from insurance through military service. A resolution was moved and carried, "That this meeting of the Medical Alliance is of opinion that any deduction from the current accounts of doctors, chemists, or institutions exceeding 15 per cent. is more than is warranted by the circumstances, and trusts that where it may be necessary the Commissioners will give instructions for deductions not to exceed 15 per cent." At a meeting of panel practitioners convened by the Brighton members of the Panel Medico-Political Union the same subject was discussed, special stress being laid upon the responsibility of insurance committees for the present position of doubt and difficulty owing to their failure to institute and maintain correct lists. This is the point raised by Mr. C. W. Hogarth at the meeting of the London Panel Committee and commented upon in THE LANCET of May 8th, p. 982. Speaking at Brighton Dr. H. J. Cardale said it was impossible that the whole of the proposed reduction could be due to men joining the army, adding that the registers kept at the Insurance Committees' offices were probably to blame. In comment we would suggest that the framers of the Insurance Acts failed in their estimate of the enormous amount of clerical work and official verification which would be necessary if accurate working of the panel system was to be obtained. Hence the present unsatisfactory situation arising out of the same cause which brought into existence "unallotted funds."

THE EFFECTS OF ANTIMONY.

ANTIMONY is used as an alloy in a large number of articles, such as type, axles for machines, and cases of projectiles, and forms a constituent of certain glazes. From time to time an outcry makes itself heard as to the perils run by the workers in such trades on a par with that against lead poisoning. Professor E. Bertarelli, of Parma University, has lately investigated the hygienic conditions of workers in antimony in the Italian mines (*Il Morgagni*, March 22nd) and was unable to trace any special morbid condition, nor any particular or general form of poisoning amongst them. Although the suspicion might arise that workers in the antimony mines would be specially subject to anæmia, yet investigation showed that it was impossible to assert that the metal had acted in producing it. Neither among the workers in the sulphide were any cases of anæmia found which would suggest that antimony had any specific action in this respect. The trade which *a priori* would be considered most fraught with danger is the manufacture of antimonial glazes, which involves fine pulverisation of the metal or of its oxide or sulphide, as there is great probability of absorption by the skin or buccal mucous membrane. The author, however, found nothing among the workers in such a factory at Leghorn which would lead him

to suppose that any poisoning took place. Nor were those forms of anæmia which certain observers have affirmed to be a common result of the absorption of antimony in industrial preparations met with in these workers, even though the most elementary precautions were neglected and the ingestion of small particles of antimonial substances must have been frequent. The conclusion seems to be that if antimony has any effect in causing anæmia or other morbid phenomena among workers it must be extremely slight.

INCOME-TAX RATES FOR THE YEAR 1915–16.

FOLLOWING on the articles in THE LANCET of April 24th and May 1st on "The Medical Man's Income-tax," and of May 15th on "Service Medical Officers and Income-tax," it may be useful to have the several rates of tax in concise form, which we extract from an explanatory article in the *Daily Telegraph* of May 25th:—

	In the £.
Normal Rate	2*s.* 6*d.*
Modified Rates:	
(*a*) Reduced Rates on Small Incomes:	
Incomes exceeding £300 but not exceeding £500	2*s.* 4*d.*
Incomes not exceeding £300	2*s.* 0*d.*
(*b*) Relief for Earned Income:	
Any individual who claims and proves that his total income from all sources does not exceed £2500, and that any part of that income is Earned income, to be entitled to be charged on his Earned income at the following rates, viz.:	
Total income not exceeding £1000...	1*s.* 6*d.*
Total income exceeding £1000, but not exceeding £1500	1*s.* 9*d.*
Total income exceeding £1500, but not exceeding £2000	2*s.* 0*d.*
Total income exceeding £2000, but not exceeding £2500	2*s.* 4*d.*

It should be noted that the relief in respect of earned income is required to be claimed at the time a return is made, and in any case before Sept. 30th, 1915. It is supplemental to any relief under paragraph (*a*) above.

PULMONARY TUBERCULOSIS IN THE TROPICS.

IN the tropics it is the infectious disorders that cause the high death-rate among human beings, coloured or white. Van Loghem[1] draws attention to the increasing importance of pulmonary tuberculosis as a cause of death in tropical countries, and particularly in the Dutch Indies. The annual death-rate from phthisis in Amsterdam for the years 1900 to 1904 was 152 per 100,000 living, in London 163. The figures in subtropical and tropical towns are often much larger, as, indeed, is the general death-rate, and Van Loghem quotes the following figures: Havana, 348; Batavia, 409; Rio de Janeiro, 463; Manila, 486; Santiago, 492; Bombay, 635; Tunis, 691; and Singapore, 692, adding that they probably err by being too low rather than too high. The death-rate from phthisis among the whites alone is higher in the Dutch Indies than in Holland; for the years 1908 to 1911 it stood at about 125 per 100,000 living in Holland, whereas in Batavia it was 177, at Semarang 200, and at Surabaya 232. The cattle here are free from bovine tuberculosis, so that there can be no question of the infection of human beings with tubercle bacilli of the bovine variety. Stress is laid upon the fact that these figures only apply to the large centres of population, the coast towns, where the admixture of natives with civilised and tuberculous whites is most thorough. Inland the mortality due to phthisis, and indeed the incidence of any form of tuberculous infection, fall away to almost nothing. The cutaneous tuberculin reaction of von Pirquet, obtained in 92 per cent. of the students at Leyden by Nolen (1911), was obtained in only 3½ per cent. of the inland Javanese inhabitants of Sumatra (Heinemann, 1914), to quote a single instance. Thus, tuberculous infection during childhood is a rarity among natives uncontaminated by contact with a higher civilisation. The result, as Van Loghem points out, is that among such people tuberculosis is an acute infectious disorder very fatal to adults; for they have not been protected, as Europeans have, by a mild attack of tuberculosis during their youth. Heinemann describes tuberculosis as an acute or subacute disease, rarely chronic, among the uncontaminated Javanese, with a great tendency to the production of generalised tuberculosis such as it seen mainly in infants and young children in Europe. So Van Loghem calls out for some method of vaccinating natives against tuberculosis, and for the enforcing of all sanitary and hygienic regulations that tend to prevent the dissemination of tubercle bacilli, as two urgent needs in tropical countries where the native inhabitants are naturally free from tuberculosis.

[1] Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam, 1915, i., 1300.

EMETINE IN THE TREATMENT OF CHOLERA.

Sir Leonard Rogers reports the results of treatment of cholera by this drug in the *Indian Medical Gazette* (1915, vol. l., p. 4). No benefit can be derived from its use, he concludes. It was thought from the good results which follow its administration in amœbic dysentery, occasionally in sprue-like diarrhœa, and also in hæmoptysis and hæmorrhage from the gastro-intestinal tract, that it might be beneficial when there is, as in cholera, extensive loss of fluid through the mucous membrane of the small intestine. During an epidemic of cholera a series of 32 cases was treated with half a grain of emetine night and morning, in addition to intravenous injections of hypertonic solution of saline and potassium permanganate by the mouth. These cases were not selected; they were also compared with 32 similar cases which were taken alternately with the test cases but not treated with the emetine. The observations extended over two months. No benefit could be recorded. The whole mortality of the 64 cases was 12·5 per cent. A comparison of the two groups of cases showed the following features:—

	Emetine.	No emetine.
No pulse on admission	10	15
Blood specific gravity above 1065 ...	8	3
Two or more intravenous salines ...	10	10
Age over 50...	1	1
Deaths	4	4

THE Cavendish lecture of the West London Medico-Chirurgical Society will be delivered on Friday, June 25th, by Professor Arthur Keith, F.R.S., at the West London Hospital.

A SESSIONAL meeting of the Royal Sanitary Institute will be held in the Guildhall, Bristol, on Friday, June 11th, when a discussion will take place at 11 A.M. on "The Coördination of Military and Civil Sanitary Services in War Time," opened by Lieutenant-Colonel D. S. Davies, R.A.M.C. (T.), medical officer of health of the city, and Mr. L. S. McKenzie, A.M.I.C.E., the city engineer of Bristol.

THE USE OF ATROPINE IN THE TREATMENT OF THOSE SUFFERING FROM THE EFFECTS OF IRRITANT AND OTHER GASES.

BY DOUGLAS V. COW, M.D. CANTAB.,
BEIT MEMORIAL RESEARCH FELLOW.
(*From the Pharmacological Laboratory, Cambridge.*)

MY object in carrying out the series of experiments which form the basis of this communication is not so much to bring to light any new fact (the action of atropine on the bronchioles has been made clear by the experiments of Dixon and Ransom[1]), as to demonstrate in a clear manner the ways in which this drug may relieve the sufferings of those who have been exposed to the action of German gases.

From such information as I have been able to obtain it does not appear that atropine is being used to any extent in the treatment of these cases. I have therefore performed these experiments as rapidly as possible; and whilst taking account of the more obvious and gross changes produced, I have paid no attention to secondary conditions, such as the tension of various gases in the blood, the estimation of which would have taken more time.

From the symptoms produced by these gases it appears that some at any rate are irritant, the result being a condition in which the sufferer has a great difficulty in breathing and in efficiently oxygenating his blood.

Twelve rabbits were arranged in pairs according to their body weight, and were exposed to either chlorine or bromine vapour for periods of 15 minutes. Each pair was exposed to the vapour by enclosing the two rabbits together in a box (20 in. by 15 in. by 15 in.) with a zinc lining and a glass lid. The amount of chlorine given was that produced by adding 20 drops of hydrochloric acid to an excess of bleaching powder; the amount of bromine was such that the lower three inches of the box showed a thick yellow layer, whilst the rest of the space in the box appeared fairly clear.

As soon as the 15 minutes' exposure to the gas was complete the animals were removed to the laboratory (the box in which the gas was given was placed in the open air) and kept in boxes at laboratory temperature throughout the remainder of the experiments.

One animal of each pair was treated with atropine, the other being kept as a control. The dose of atropine given varied between 2·5 and 4 milligrammes, given in three, four, or five separate injections (the first injection in each case was intravenous, the others subcutaneous). In some cases the atropine treatment was started directly the animals were removed from the gas; in other cases the treatment was not commenced until 30, 60, or 120 minutes after removal from the gas.

Two pairs of the animals were also placed in a box through which a stream of oxygen was passed.

The results of the atropine treatment were very marked and agreed qualitatively throughout the series, though the effects were, of course, more obvious in some animals than in others. When removed from the gas the animals were in every case breathing with difficulty—head thrown back, nostrils working convulsively, and nose and mouth wet with inflammatory fluid. The rate of respiration at this stage varied between 92 in the worst case (chlorine) and 20 in the least urgent case (bromine), though in all cases respiration was laboured. The bromine animals were also very drowsy.

The condition became progressively worse; in about 30 minutes after removal from the gas stridor, crepitations, and rhonchi were evident; diminished resonance over the lungs was noted in one pair only (chlorine).

Atropine treatment affected the animals in the following ways:—the animals became more alert, respiration became much easier. less laboured, and more effective, the chest obviously filling and emptying more completely with each respiration than in the controls; the physical signs in the chest disappeared in every case except two, and in these two animals stridor and crepitations disappeared, a few rhonchi only remaining.

A particularly noticeable feature was the fact that of the two pairs which had oxygen treatment the two controls (which received no atropine) did not appear to be in any better case than other controls which received no extra oxygen; indeed, as it happened they were about the worst cases of the whole series.

The improvement in the animals which received oxygen as well as atropine was particularly obvious. After about an hour from the commencement of the treatment they appeared to be practically normal, though in most cases atropine alone seemed quite sufficient to relieve the acute symptoms.

The rate of respiration was not very greatly affected except in one case in which it was very much accelerated (92) before treatment commenced. This animal's breathing gradually came down to 60 half an hour after the first dose of atropine, and thereafter to 54, 52, and 50. The control animal of this pair, whose respiration was 66 on removal from the gas, continued to breathe at an average rate of 55 throughout. The only other case in which the rate of respiration was greatly changed was that of the other atropine and oxygen animal, in which the respiration came down from 22 to 14 per minute, the control in this case (oxygen only) falling only from 26 to 24.

All these animals were killed about five hours after the commencement of the treatment: the post-mortem condition of the lungs of the atropine animals as compared with the controls was most instructive. All the lungs from the atropine animals were normally collapsed (partially collapsed in the worst case), whilst in the case of the controls the lungs remained distended and retained the shape of the thorax like plaster casts after the chest was opened. A certain amount of frothy fluid exuded from the cut bronchi, the amount varying considerably, but always more in the controls than in the atropine animals.

Again the weight of the lungs showed marked differences as between the atropine animals and the controls; the average weight of the lungs from the atropine animals was 6·7 grammes, as against 7·9 grammes in the case of the controls, though the average body weights of the two classes were 1048 and 1036 respectively.

All the lungs floated in water: in three cases they were practically submerged: all these three were from animals which had received no atropine.

It is known from the work of Dixon and Ransom (*supra*) that so long as an animal is under the influence of atropine the bronchioles remain in a

[1] Dixon and Ransom: Journal of Physiology, 1912, xlv., 5, 413.

condition of maximal dilatation. The means whereby this drug relieves the symptoms, as described above, are sufficiently obvious to need no discussion. It remains, therefore, only to point out that without atropine oxygen inhalation produces little or no amelioration of the symptoms; that atropine treatment should be commenced as soon as possible; and that atropine in such doses as I have used should not be given to men, bearing in mind the fact that herbivorous animals have a peculiar tolerance to atropine.

Atropine has the advantage over hyoscine and hyoscyamine in that the stimulant action on the central nervous system is more pronounced and the subsequent depressant action less in evidence than in the case of these other drugs.

ANNUAL REPORT FOR 1913 OF THE REGISTRAR-GENERAL.

IN a leading article in THE LANCET of May 8th we commented generally on the appearance of this report, which is the third of a new series inaugurated in the year of the recent Census. A change of form and of detail in these reports was required in order to give effect to the previously determined substitution of administrative for registration districts throughout England and Wales, the object being to coördinate conflicting areas for statistical as well as for sanitary purposes. The reasons assigned in favour of these and other subsidiary changes are set forth in the official reports for 1909 and 1910. Careful reading of the first volume of this series, which related to 1911, indicated the sufficiency of the precautions adopted for the preservation of continuity with the records of the past. Similar precautions have evidently been observed in preparing the present report. That the national records at Somerset House—essential as they are to due progress in public health—will in future be protected from ill-advised curtailment may reasonably be inferred from the exemplary attitude of the central authority to which reference has already been made.[1]

The present report, like its several predecessors, is the joint production of the Registrar-General and his statistical superintendent. The purely medical portion is contributed by Dr. T. H. C. Stevenson, who has again shown commendable care and skill in the conduct of the work.

We proceed to notice briefly those portions of the report that appear specially important from the view-point of preventive medicine.

Estimates of Population.

Inasmuch as the rate of natural increase of the English population has fallen since 1911, whilst there has been an increased loss of passenger movement, there is reason to believe that the rate of increase experienced in the last intercensal period has not been maintained subsequently. In no year previous to 1911 had a rate of natural increase been recorded so low as that of the last three years. The fall in the death-rate, which for a number of years had sufficed to compensate for the defect in the birth-rate, has now ceased to do so, and it seems likely that a period of definitely lower natural increase than in the recent past has now set in. To some extent this is due to the age constitution of the population. Since 1901, however, owing mainly to increased proportion of old persons among the living, resulting from fall in the birth-rate, the age constitution has become less favourable; and as this change progresses it will increasingly tend to raise the death-rate, and thus to diminish the natural increase. In view of the foregoing considerations it has been decided to frame the population estimates for future years on the natural increase of the living and the net effect of migration—the assumption upon which previous estimates were based having proved faulty. On the assumption of a continued increase, by geometrical progression, at the rate experienced in 1901–10 the population at the middle of 1913 is estimated at 36,919,339, but this number would have been reduced by 310,000 had the estimate been based on the natural increase and the migration returns.

Changes in Natality and Fertility.

Stated in terms of estimated population at all ages and of both sexes, the births registered in 1913 were equal to a rate of 23·9 per 1000, which is in defect of the average rate for the previous decennium by not less than 2·4. With the exception of the rate for the immediately preceding year, it was the lowest on record. Moreover, the provisional figures for 1914 indicate a still further fall of 0·3 per 1000. The birth-rate necessarily varies with the proportion of females living at conceptive ages, and with the proportion of these who are married. The changes in these proportions at the several censuses since 1871 are discussed in the text, and certain of these are specified as influencing the birth-rate, either by increase or by decrease. Among these changes may be noticed (*a*) the increased proportion of women of conceptive ages in the total population, which is a direct consequence of the fall in the birth-rate already recorded; (*b*) the varying proportion of women of fertile ages who are married; and (*c*) the increasing average age of married women under 45 years old. This appears to have been continuous during recent year, and must have contributed to the fall in the birth-rate, inasmuch as fertility is known to decrease with advancing age. As, however, our registers contain no particulars of the age of parents, nothing is known of the fertility of English women at the several ages. It is therefore at present impossible to determine the effect upon the birth-rate of increase in the age of potential mothers. The effect of decreases in the fertility of married women, due in some measure to their greater average age, but largely no doubt to deliberate restriction of child-bearing, is masked to some extent by the net result of other changes in the constitution of the population, so that the fall in the birth-rate cannot be fully accounted for.

Birth-rates in Different Localities.

In view of the impracticability of dealing separately with the statistics of the numerous administrative districts in the country, the Registrar-General in his recent reports has grouped the facts of birth (as well as of mortality) in "four geographical divisions," corresponding respectively to the north, the south, and the midland areas of England and the principality of Wales. The contents and limits of these areas cannot here be given, but they appear in the official reports of the last three years. In the summary tables of each division, the data for urban are distinguished from those of rural districts. Stated in terms of total population the highest birth-rate in 1913 was that of Wales, 26·9 per 1000, whilst the rate in the south of England was only 21·8. Moreover, if London were not included in the south the rate for that division would be lower still. The rate in the midlands was 23·6 and in the north 25·2. When different parts of the country are compared, Wales comes first, followed in order by the north, the midlands, and the south, whatever measure of fertility be employed.

Illegitimacy.

It has long been customary to measure illegitimate fertility by the proportion of illegitimate to total births, but by this method no satisfactory index is afforded of the fertility of unmarried women, which can only be correctly ascertained by comparing the illegitimate births with the number of possible unmarried mothers. The decline of illegitimacy appears to be considerably greater when measured by the latter method than by the former. In 1913 the illegitimate rate was equal to 7·9 per 1000 unmarried and widowed women, aged 15–45 years. Comparing the proportion of illegitimacy in that year with the proportion prevailing in the quinquennium 1876–80, it appears that, if based on the standard of total births, the rate of illegitimacy would seem to have decreased by less than 10 per cent., whereas the reduction will be found to equal 45 per cent. if calculated on the number of single and widowed women in the population. Relatively to unmarried women of these ages, illegitimate births were most numerous in the rural

[1] THE LANCET, May 8th, 1915, p. 974.

districts and least so in the metropolis. They were also most numerous in Wales and least numerous in the south of England. This is true of each of the three years 1911–13.

Mortality in Relation to Sex, Age, and Locality.

The deaths registered in 1913 were in the proportion of 13·7 per 1000 living at all ages and of both sexes, a rate which is 1·2 per 1000 below the average for the preceding decennium. With the exception of that of the two previous years, the mortality in 1913 was the lowest on record. The standardised mortality of males exceeded that of females by 23 per cent. Since 1841–5 the mortality of females has fallen by 39·4 per cent., while that of males has fallen by only 31·5 per cent. The mortality of males is in excess at all ages except in the years of childhood, when mortality is at its minimum. The excess is very unevenly distributed, being large in infancy, negative in childhood, then gradually increasing to a maximum in later middle life, and subsequently declining again with advancing age. Up to the age of 35 for males and of 45 for females the mortality of 1913 was, at each period, only about half that recorded 50 years ago, but after these ages respectively the fall has been comparatively slight. For each of the four geographical divisions the rates of mortality are given in an instructive table. Presuming that the constitution of the population was less favourable to a low mortality in 1913 than in 1901, it is shown that although the effect of standardisation upon London and the smaller urban districts is only slight, the mortality of the county boroughs is increased by that process by 3 per cent., whilst that of the rural districts is diminished by 14 per cent., the contrast between them being thus greatly increased. As in the two preceding years the relative as well as the actual excess of mortality was least in the rural districts, whilst it increased with urbanisation to a maximum in London. Recent evidence therefore confirms the general impression that urban conditions tell more heavily on males than on females. The standardised death-rate of the north exceeds that of other parts of England. That of the principality is intermediate between the north and south, but in early adult life the customary tendency to excess of Welsh mortality over even that of the north of England still asserts itself. This tendency is more marked amongst females in the rural areas. The lowest mortality mostly prevails in the midlands and in the south.

Mortality of Infancy and Early Childhood.

Of the total deaths in 1913 those occurring in the first year of life amounted to 18·9 per cent., and were equal to 108 per 1000 births, a rate below the decennial average by 11 per cent. In different localities the rates varied from 131 in the northern county boroughs to 69 in the southern rural districts. The evil effects of residence in town as compared with the country are shown by the fact that the rate for the rural districts is exceeded by 41 per cent. by that of the county boroughs, but only by 20 per cent. in the case of London. The comparatively small excess in the metropolis indicates how largely the adverse influences of urban surroundings may be avoided. It is a noteworthy fact that the mortality of the County of London—the centre of the largest urban community known—was lower than that of England and Wales in the aggregate. Very remarkable is the geographical distribution of infant mortality; it was highest in the north of England and lowest in the south. Even the rural districts of the north are more destructive to infant life than is London, the excess being much greater in the male sex. It is interesting to extend comparison of infant mortality up to school age—i.e., to the end of the period of exclusively home influence. The range in the second year of life is greater than in the first. It varies from 14·5 in the southern rural districts to 50·8 in the northern county boroughs. The chances of survival in the second year of life in the latter are only slightly greater than those of the first year in the former. The causes of mortality in early life will be referred to later in dealing with the total loss of life from particular diseases. The mortality of illegitimate infants is about double that of the legitimate, the excess being greater among females. The mortality of illegitimate exceeds that of legitimate infants especially in the case of fatal syphilis, the loss of life from which infection is eight times as great among these unfortunates as it is among legitimate infants.

(To be concluded.)

THE ANTI-FLY EXHIBITION.

A VERY useful and practical exhibition, the Anti-fly Exhibition, was opened on May 13th at the Gardens of the Zoological Society in Regent's Park. This title is pregnant with the meaning of the exhibition by which it is intended to indicate that flies—the common house-fly among them—are not a mere nuisance but dangerous enemies to the race. Musca domestica, in the cause of ideal hygiene, must be fought with the same implacable determination employed in dealing with the malaria-spreading mosquito.

The Transmission of Infection by Flies.

The danger with which the public is not yet sufficiently familiar is rendered manifest immediately on entering the exhibition. A drawing of the common house-fly is suspended to the wall, well in view, which is so large in scale that the hairy covering of the feet and legs is seen, so that it can be readily realised that moist filth from any dustbin, gully, or midden can be taken up by a moving insect. Later, when partially dried, this filth may drop off perhaps on any foodstuff over which the fly walks, and the insect may have come in contact with the dejecta of a typhoid patient. The fly, moreover, is a very greedy beast, and will vomit undigested food so as to replenish its stomach with other food it prefers. The picture shows how by regurgitation specific germs previously consumed are brought up and ejected on the supplies in unprotected larders, while the insect, emulating the noble Romans of the days of Petronius, quietly proceeds to consume the better fare it has discovered. In this process a large bubble is formed outside the fly's mouth which we see in the drawing. Beneath the revolting and engrossing picture of the fly there is a series of beautiful models of the germs found by Dr. Birmingham in these bubbles coming from flies. These models, magnified to 1500 diameters, show that flies carry the germs of typhoid fever, tuberculosis, cholera, anthrax, and plague. Flies are also believed, on good grounds, to spread ophthalmia, dysentery, and infantile diarrhœa. After feeding on liquid or moist matter contained in excrement, wounds, sputum, decaying meat, fish, or other organic substances, they penetrate our larders and alight on our food. The extent to which disease is spread in this way cannot as yet be estimated, but we need not wait for blood-curdling statistics before deciding that the fly is a dangerous enemy to society.

Preventive and Other Anti-fly Measures.

Both the germs and the processes by which they are spread, so magnified that we can easily see and understand, are now exhibited. No one can plead ignorance after this object-lesson, and we are immediately led to inquire how so evident a danger is to be avoided. Naturally, the first step is to prevent flies from coming into existence. Where this can be done we have the most certain remedy. Therefore we are shown at the exhibition what are the favourite breeding-places for flies. They breed freely in every form of offal. Preserved in spirits, there are shown at the exhibition all sorts of offal and refuse—fishes' heads, putrid shell-fish, and kitchen débris—in which flies have laid their eggs. The first lesson, therefore, is that no moist offal should be allowed to remain near human settlements; it should be burnt, or buried, or transported where it can do less harm, if more radical methods fail.

At the Zoological Gardens there are devices for dealing with stable and farmyard manure, which provide the most extensive breeding-ground for flies. This has been demonstrated by a simple experiment. After flies have laid their eggs on a small heap of stable manure, if it is boxed over with wire gauze so that none of the flies can escape but must remain to multiply at their birthplace, the rapidity of their increase is demonstrated. And when we realise how quickly a plague of flies can be brought about, we only want to learn the methods of remedy to apply them with a will. A manure heap can be converted into a fly-trap with very little trouble. By placing round it at a distance of 12 inches a ring of dry straw the straw will quickly contain the maggots as they wish to pupate, and the straw is burnt every four days so as not to give the chrysalides time to transform themselves into flies. It is not always feasible to dig manure into the ground; it should always be kept dry, or be treated with an insecticide which may be superficially applied, and which will keep flies away,

All these measures mean care, watchfulness, and trouble. The sprinkling of poisonous fluids, which can be used not only on manure heaps, but on walls, trees, and roofs, in the clearly indicated parts of premises, is a simple measure. One of the oldest methods of making fly-traps is also one of the best. It is to dip bunches of grass in a mixture of treacle or brown sugar impregnated with some arsenious salt, and hang them up in likely spots, taking care to place them beyond the reach of children. The use of poison, however, always involves some risk, and many will prefer the traps that catch living flies instead of poisoning them. From America we get an ingenious and very simple device called the Minnesota fly-trap. It is an oblong box of wire gauze. One side is bent inwards to form an arch, and at the apex there are several holes big enough to push a pencil through. The box is placed on the ground or on a shelf or table, the arch covering a bait such as a banana. A little room is left so that the fly may pass under the sides of the box and reach the bait. When satiated the fly goes upwards and finds its way through one of the holes into the portion of the box covering the arch. Here it will struggle to get out, but always by flying upwards and sideways and towards the light. It never thinks of going downwards to find the little hole by which it entered. Thus caught, the flies can be killed by dipping the trap into hot water or holding it over fumes of paraffin oil or benzine. This trap is shown at the Anti-fly Exhibition, together with other and more complicated traps. The Minnesota trap is the easiest to carry about and to make.

An Effective Insecticide.

Though war against the common house-fly and blow-flies or bluebottles is the main purpose of this exhibition, the danger of disease spread by insects generally is considered. The fact is illustrated that we have in crude mineral oil a cheap, easily obtainable, and applicable specific. Not only is it used to prevent mosquitoes breeding in stagnant water, but it can be made into an emulsion which will rid us of such pests as fleas. In war perhaps lice are the cause of our principal concern. In Serbia and Montenegro, and we fear in some of the German prisons or internment camps, they are spreading typhus fever. The work done in destroying flies by the English Commission has saved thousands of lives to our gallant allies. Professor H. Maxwell-Lefroy, with the assistance of Dr. Harriette Chick, of the Lister Institute, has issued a small pamphlet of instructions dealing especially with the use of crude oil, and 4000 lb. of crude oil emulsion have been sent to the soldiers at the front Anyone can make the emulsion. Five and a half pints of crude mineral oil with three pounds of soft soap and about half a pint of water will form a jelly that will prove an efficient insecticide. A more delicate preparation is exhibited at the exhibition made with "bottom" oil and Texas fuel oil, but the principle is the same. The vapour of the lighter oil kills insects, and the grease on the skin or in the clothes kills by contact. The soap makes it feasible to mix the emulsion with water and use it for ordinary washing purposes. If some of the emulsion is allowed to dry into the clothes vermin will not approach those who wear clothes thus treated. The same protection is secured by rubbing a little of the emulsion over the skin. During the war this is likely, one would think, to prove a most useful preparation. A few tins holding a grease or jelly that looks like soft soap are not interesting to look at, but when we realise the results that can be obtained by distributing these tins they gather importance in our sight, and the desire to send any quantity of them to the typhus-stricken towns and villages of Serbia and Montenegro, has been expressed by more than one visitor.

Everyone who can spare the time should visit the Anti-fly Exhibition.

LITERARY INTELLIGENCE.—Under the title of "Sanitation in War," the lectures by Major P. S. Lelean, assistant professor of hygiene at the Royal Army Medical College, with an introduction by Sir Alfred Keogh, are announced for publication about June 1st by Messrs. J. and A. Churchill. The subjects dealt with are: Physical Fitness for War, Anti-typhoid Inoculation, The March, Sickness in the Army, The Rôle of Insects in War, Field Conservancy, Medical Organisation and Administration in the Field, and Water and Water-supplies.

ASYLUM REPORTS.

Royal Albert Institution for the Feeble-minded of the Northern Counties (Annual Report for the Year ending June 30th, 1914).—At the time of its establishment, 50 years ago, the Royal Albert was the only institution of its kind in this part of the country, and since its opening it has dealt with no less a number than 3433 feeble-minded persons. It is satisfactory to note that at no time since its foundation has its financial and general position been higher or its prestige greater. Not only from its size and general equipment, but also from the results in educating and training the feeble-minded, the institution is second to none of its kind in the world. Mr. Archibald R. Douglas, the medical superintendent, comments on the passage of the Mental Deficiency Act of 1913, and says that about the future of the Royal Albert and the other kindred institutions there ought to be no doubt. From the fact of possessing a complete equipment of buildings and a full staff of teachers and manual trainers, these establishments are quite prepared and ready to act as training centres. Now is the time for local authorities and boards of guardians who do not wish to provide for their own feeble-minded to apply for accommodation to be reserved for their cases in these institutions. Another very important question for the consideration of the central committee in the near future will be the reception of children above the age of seven years sent by the education authorities.

The aggregate number of patients under treatment during the year was 807, with an average daily number resident of 696. An undesirable preponderance of those admitted have been low-grade and feeble cases. There were 65 discharges and 13 deaths, the death-rate on the average number resident being only 1·87 per cent. The farm colony has been in constant occupation since October last, and has proved itself to be a useful dependency of the institution. For the past year the schools have been conducted on a novel plan, which provides for purely educational work during the first half of the day, the afternoons being devoted to the new industrial occupations which have been already introduced and which were mentioned in the last report. This departure has succeeded beyond the most sanguine expectations and has infused fresh interest into the teaching staff and all concerned. The most important factor in this rearrangement is that it provides employment for the greatest possible number of patients. Already these new industrial occupations are almost self-supporting, since for the most part the receipts from the articles made have defrayed the cost of the materials used. Care has also been bestowed on the provision of simple kindergarten occupations for the large number who are incapable of learning anything more, and who would therefore be otherwise wholly unemployed. The Herbert Storey Industrial Schools and Workshops have been maintained in a high state of efficiency. The committee have added cloth-weaving to the list of trades taught here, and have introduced one of Hall's hand-power looms.

VITAL STATISTICS.

VITAL STATISTICS OF LONDON DURING APRIL, 1915.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the 10 diseases specified in the table was equal to an annual rate of 6·3 per 1000 of the population, estimated at 4,516,612 persons; in the two preceding months the rates were 7·4 and 6·6 per 1000 respectively. The lowest rates last month were recorded in St. Marylebone, Islington, Holborn, the City of London, and Camberwell; and the highest rates in Stoke Newington, Bethnal Green, Stepney, Greenwich, and Woolwich. The prevalence of scarlet fever showed a further slight decline last month; among the metropolitan boroughs this disease was proportionally most prevalent in Hammersmith, the City of Westminster, Stoke Newington, Stepney, Battersea, Wandsworth, Greenwich, and Woolwich. The Metropolitan Asylums Hospitals contained 2339 scarlet fever patients at the end of last month, against 3609, 2989, and 2514 at the end

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING APRIL, 1915.

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING APRIL, 1915.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated population in the middle of 1914.	NOTIFIED CASES OF INFECTIOUS DISEASE.												DEATHS FROM PRINCIPAL INFECTIOUS DISEASES.										Deaths from all causes.	Death-rate per 1000 living.†
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Follomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	**4,516,612**	—	**1144**	**590**	**1**	**62**	**2**	**18**	**229**	**140**	**10**	**2196**	**6·3**	—	**503**	**35**	**50**	**182**	**5**	**66**	**841**	**2·4**	**6776**	**19·6**
West Districts.																									
Paddington	142,055	—	36	25	—	1	1	—	9	1	—	73	6·7	—	12	1	—	6	1	5	25	2·3	211	19·3
Kensington	170,817	—	42	10	—		—	—	3	12	—	68	5·2	—	28	1	1	3	—	2	35	2·7	270	20·5
Hammersmith	124,760	—	38	15	—	1	—	1	9	6	—	70	7·3	—	2	1	—	6	—	2	11	1·1	184	19·0
Fulham	158,849	—	38	21	—	—	—	—	5	2	—	66	5·4	—	37	2	2	6	—	1	48	3·9	231	19·6
Chelsea	63,791	—	11	8	—	4	—	—	—	4	—	27	5·5	—	14	—	—	—	—	1	15	3·1	96	18·6
City of Westminster	152,346	—	59	17	—	—	—	—	6	3	—	85	7·3	—	14	4	—	1	—	3	22	1·9	221	19·9
North Districts.																									
St. Marylebone	112,892	—	17	16	—	2	—	—	6	2	—	43	5·0	—	11	—	1	1	—	1	14	1·6	154	18·2
Hampstead	86,731	—	14	11	—	—	—	1	1	3	—	30	4·5	—	4	1	—	2	—	1	8	1·2	95	15·1
St. Pancras	212,497	—	47	31	—	2	—	—	10	4	1	95	5·8	—	16	1	1	6	—	1	25	1·5	299	18·2
Islington	324,764	—	62	45	—	1	—	2	8	7	3	128	5·1	—	48	5	3	19	1	4	80	3·2	543	21·3
Stoke Newington	50,454	—	19	11	—	1	—	—	3	—	1	35	9·0	—	6	2	—	2	—	1	11	2·8	64	15·7
Hackney	223,724	—	34	20	—	10	—	—	15	11	—	90	5·2	—	16	1	1	4	—	2	24	1·4	288	16·9
Central Districts.																									
Holborn	45,861	—	8	4	—	1	—	—	1	2	—	16	4·6	—	2	—	2	1	—	—	5	1·4	64	18·3
Finsbury	83,212	—	24	7	—	1	—	1	3	2	—	38	6·0	—	6	1	—	11	—	2	20	3·1	135	20·9
City of London	17,129	—	3	2	—	—	—	—	—	—	—	5	3·8	—	—	—	—	—	—	1	1	0·8	35	27·7
East Districts.																									
Shoreditch	108,869	—	24	12	—	—	—	—	10	6	—	52	6·2	—	9	—	3	9	—	1	22	2·6	203	25·1
Bethnal Green	127,662	—	34	34	—	1	—	2	6	3	1	81	8·3	—	17	1	5	6	—	5	34	3·5	209	22·1
Stepney	273,265	—	81	68	1	4	—	1	21	2	1	179	8·5	—	20	1	5	2	—	6	34	1·6	386	19·2
Poplar	160,222	—	39	31	—	1	—	1	12	1	—	85	6·9	—	25	2	5	5	—	7	44	3·6	265	21·4
South Districts.																									
Southwark	186,941	—	40	16	—	9	—	2	17	10	—	94	6·6	—	14	2	6	5	—	1	28	2·0	315	22·1
Bermondsey	124,213	—	25	8	—	2	1	—	8	9	1	54	5·7	—	25	1	—	10	1	5	42	4·4	262	27·4
Lambeth	296,724	—	74	31	—	2	—	3	19	10	—	139	6·1	—	16	3	3	9	1	3	35	1·5	462	19·9
Battersea	167,338	—	52	18	—	3	—	—	4	4	—	81	6·3	—	54	—	1	18	—	4	77	6·0	286	22·5
Wandsworth	338,998	—	106	36	—	4	—	2	12	12	1	173	6·7	—	41	3	4	10	—	2	60	2·3	435	16·8
Camberwell	262,020	—	59	17	—	2	—	—	12	5	—	95	4·7	—	20	—	1	9	—	3	33	1·6	388	19·1
Deptford	109,182	—	27	10	—	3	—	—	10	4	1	55	6·6	—	10	2	2	15	1	1	31	3·7	160	18·9
Greenwich	96,037	—	40	13	—	1	—	1	4	7	—	66	9·0	—	7	—	—	8	—	—	15	2·0	161	21·5
Lewisham	172,433	—	35	25	—	2	—	1	7	2	—	72	5·4	—	15	—	1	5	—	1	22	1·7	172	12·8
Woolwich	122,836	—	56	28	—	3	—	—	8	6	—	101	10·7	—	14	—	3	3	—	—	20	2·1	182	19·8
Port of London	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup. † The death-rates are corrected for variations in sex and age constitution of the populations of the several boroughs, the population of England and Wales being taken as the standard

of the three preceding months; the weekly admissions averaged 272, against 317, 324, and 278 in the three preceding months. Diphtheria also was slightly less prevalent than in the preceding month; the greatest proportional prevalence of this disease was recorded in Paddington, Stoke Newington, Bethnal Green, Stepney, Poplar, and Woolwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1621, 1562, and 1362 at the end of the three preceding months, had further declined to 1223 at the end of last month; the weekly admissions averaged 136, against 160, 172, and 142 in the three preceding months. Enteric fever was less prevalent than in other recent months; this disease was proportionally most prevalent last month in Chelsea, Hampstead, Southwark, Deptford, and Woolwich. The Metropolitan Asylums Hospitals contained 60 enteric fever patients at the end of last month, against 50, 64, and 46 at the end of the three preceding months; the weekly admissions averaged 13, against 13 and 8 in the two preceding months. Erysipelas was proportionally most prevalent in Paddington, Hammersmith, Hackney, Shoreditch, Stepney, Poplar, Southwark, and Deptford. The 18 cases of puerperal fever notified during the month included 3 in Lambeth, and 2 each in Islington, Bethnal Green, Southwark, and Wandsworth. The cases of cerebro-spinal meningitis numbered 140, this disease being proportionally most prevalent in Kensington, Chelsea, Shoreditch, Southwark, Bermondsey, and Greenwich. The 10 cases of poliomyelitis included 3 in Islington.

The mortality statistics in the table relate to the deaths of persons actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided; the death-rates from all causes are further corrected for variations in the sex and age constitution of the populations of the several boroughs. During the five weeks ending May 1st the deaths of 6776 London residents were registered, equal to an annual rate of 19·6 per 1000; in the three preceding months the rates were 19·6, 20·7, and 21·2 per 1000 respectively. The death-rates last month ranged from 12·8 in Lewisham, 15·1 in Hampstead, 15·7 in Stoke Newington, 16·8 in Wandsworth, and 16·9 in Hackney, to 22·1 in Bethnal Green and in Southwark, 22·5 in Battersea, 25·1 in Shoreditch, 27·4 in Bermondsey, and 27·7 in the City of London. The 6776 deaths from all causes included 841 which were referred to the principal infectious diseases; of these, 503 resulted from measles, 35 from scarlet fever, 50 from diphtheria, 182 from whooping-cough, 5 from enteric fever, and 66 from diarrhœa and enteritis among children under 2 years of age. The lowest death-rates from these diseases in the aggregate were recorded in Hammersmith, Hampstead, St. Pancras, Hackney, Holborn, and the City of London, and the highest rates in Fulham, Islington, Bethnal Green, Poplar, Bermondsey, Battersea, and Deptford. The 503 deaths from measles were 317 in excess of the corrected average number in the corresponding period of the five preceding years; this disease was proportionally most fatal in Kensington, Fulham, Chelsea, Islington, Poplar, Bermondsey, and Battersea. The 35 fatal cases of scarlet fever were 22 above the corrected average number, and included 5 in Islington, 4 in the City of Westminster, 3 in Lambeth, 3 in Wandsworth, and 2 each in Fulham, Stoke Newington, Poplar, Southwark, and Deptford. The 50 deaths from diphtheria were 17 in excess of the corrected average; this disease was proportionally most fatal in Holborn, Shoreditch, Bethnal Green, Poplar, and Southwark. The 182 deaths from whooping-cough were 53 above the corrected average; the highest death-rates from this disease were recorded in Finsbury, Shoreditch, Bermondsey, Battersea, Deptford, and Greenwich. The 5 deaths from enteric fever were 3 below the corrected average number, and belonged respectively to Paddington, Islington, Bermondsey, Lambeth, and Deptford. The mortality from diarrhœa and enteritis among children under 2 years of age was proportionally greatest in Paddington, Finsbury, Bethnal Green, Stepney, Poplar, Bermondsey, and Battersea. In conclusion, it may be stated that the aggregate mortality in London last month from the principal infectious diseases, excluding diarrhœa, was 110 per cent. above the average.

RATS AND THE PORT OF LONDON.—The number of rats caught at the docks and on vessels arriving at the Port of London in 1914 was 42,916. Of these, 2716 were subjected to bacteriological examination, but in no case was there any evidence of plague.

THE SUCCESS OF THE PROBATION ACT.—Mr. R. Wallace, K.C., in binding over a prisoner at the London Sessions on May 20th, said that over 90 per cent. of the prisoners bound over under the Probation Act never saw the inside of a police-court again, a satisfactory result on grounds both of morality and of finance.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments have been notified:—Fleet-Surgeon: R. T. Gilmour to the *Vivid*, additional, for disposal. Staff-Surgeons: C. R. Rickard to the *Topaze*; A. H. S. Richardson to the *Skirmisher*; A. La T. Darley and J. C. Bringan to the *Victory*; P. L. Crosbie and J. J. H. Rooney to the *Pembroke*; and A. C. W. Newport to the *Vivid*. Surgeons: J. P. Berry (Reserve) to the *Victory*; H. E. Perkins to the *Pembroke*; and G. B. Cockrem to the *Vivid*. Temporary Surgeons: T. M. Wood-Robinson to the *Black Prince*; W. Whitfield to the *Conqueror*; W. A. Bailey to the *Monarch*; A. T. R. Wollaston to the *Agincourt*; R. H. H. Newton to the *King George V.*; E. D. Granger to the *Centurion*; J. G. Nicholson to the *Albemarle*; H. Wilks to the *St. George*; A. H. Wear to the *Ajax*; G. M. Heiron to the *Africa*; and H. B. Padwick and J. Paxton to Haslar Hospital.

ROYAL ARMY MEDICAL CORPS.

The undermentioned are granted temporary rank whilst serving at the Edmonton War Hospital:—Dated April 20th: Lieutenant-Colonel: Spencer Mort. Major: William Benjamin Batchelor Taylor, Henry Martin Rashbrook, and David Morgan Hughes.

George Arthur Wright (late Lieutenant-Colonel, Royal Army Medical Corps, Territorial Force) to be temporary Lieutenant-Colonel whilst serving at the Military Hospital, Whalley (dated May 5th).

The undermentioned temporary Lieutenants to be temporary Captains:—Dated May 26th: Norman Black, late Captain, Singapore Volunteer Corps; and John Paton, late Captain, Royal Army Medical Corps, Territorial Force.

Captain John A. Hayward, having ceased duty with the British Red Cross Hospital, Netley, relinquishes his temporary commission (dated May 12th).

Edgar William Willett, late Surgeon-Captain, Volunteer Medical Staff Corps, to be temporary Captain (dated April 27th).

Lieutenant Ian Macdonald relinquishes his temporary commission on account of ill-health (dated April 29th).

Lieutenant Frank H. Rae relinquishes his temporary commission (dated April 28th).

To be temporary Lieutenant: Daniel McKinlay Reid (dated April 10th). Temporary Lieutenant Owen Richards to be temporary Captain (dated May 21st).

The undermentioned to be temporary Lieutenants: Dated April 24th: Joseph Henri Napoleon Felix Savy, Henry Adams, Colin George Shearer, James David Mackinnon, Alfred George Brown Duncan, Herbert Hampden Taylor, George Fleming, John Ross, William Fleming Stevenson, Thomas Holmes Scott, George Francis Clegg Walker, William Magner, Joseph Edward Judson, Thomas Battersby Jobson, Joseph Humphrey Jones, Godfrey Douglas Hindley, James Henry Edwin Davis, Thomas Clifford, Valentine Henry Blake, Alfred Reginald Rcche, Maurice Gerald McElligott, Denis Victor O'Connor, Robert Bern Tydd Stephenson, John Rhodes Dickson, Sidney James Wareham, and James Johnston Abraham. Dated April 25th: Daniel Owen Twining, Arthur Lawrence Jackson, Everard Cecil Abraham, Wilfred Raffle, and Cedric Roland Denny. Dated April 26th: Edgar Taunton, Richard Harrison, George Todd MacLean, Geoffrey Andrew Bird, David Fleck, Caleb Thomas Hilton, Stanley Elder Humphreys, Williamson Rust Reith, John Sneed Bookless, Charles Forbes Harford, Stephen Veitch Telfer, James Smith, Alexander Cameron Renwick, George Loudon Neil, Gerard Edward Lockyer, John Kean, Robert Thomas Herron, Ernest Edward Frazer, Andrew Crawford, William Reginald Ward Asplen, and Richard Henry George Weston, from 15th (Service) Battalion, The King's (Liverpool Regiment). Dated April 27th: Charles Gordon MacKay, Cecil Claude Cragg, John Newbury Fraser Ferguson, John Menlove Bennion, Arthur Richmond, George McMullan, Alfred MacKenzie Clark, Reginald Frederick Yencken, Aubrey John Colby Tingey, John Roberts Pate, Charles Edwin Price, William Samuel Nason, and George Sefton Miller. Dated May 8th: John Jones. Dated May 21st: Francis Mark Farmer to be temporary honorary Lieutenant.

INDIAN MEDICAL SERVICE.

The services of the undermentioned officers are replaced temporarily at the disposal of His Excellency the Commander-in-Chief in India:—Major E. R. Rost and Major R. D. Saigol. Lieutenant-Colonel Selby Herriot Henderson has been nominated a member of the United Provinces Legislative Council vice Colonel C. C. Manifold, C.B., resigned. Lieutenant-Colonel J. Lloyd Jones, Assay Master, Bombay, has been granted two months' leave.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

The undermentioned Lieutenants are confirmed in their rank:—Arthur C. Bateman, Edmond Robinson, and Charles A. Mason.

TERRITORIAL FORCE.

Royal Army Medical Corps.

1st Northumbrian Brigade: Surgeon-Captain Robert A. Nesham to be Surgeon-Major.

1st Scottish General Hospital: The undermentioned to be Lieutenants:—Herbert John Adam Longmore, Douglas Wales Berry, and Cadet Cameron Macdonald Nicol, from Aberdeen University Contingent, Senior Division, Officers Training Corps.

2nd Southern General Hospital: Captain William Cotton is seconded.

1st Western General Hospital: Captain Keith W. Monsarrat is seconded.

South Midland Casualty Clearing Station: Captain James L. Joyce is seconded. Walter Mundy-Cox to be Lieutenant.

3rd London General Hospital: William Francis Bensted Bensted-Smith to be Lieutenant.

1st Southern General Hospital: Captain Albert Lucas to be Major. Major Otto J. Kauffmann to be Lieutenant-Colonel. Christopher Martin to be Captain, whose services will be available on mobilisation. Leonard Kirkby Thomas to be Captain, whose services will be available on mobilisation.

East Anglian Casualty Clearing Station: Richard Vincent Slattery to be Lieutenant.

1st East Anglian Field Ambulance: Lieutenant Laurence Henry Hutchins, from the 3rd East Anglian Field Ambulance, to be Lieutenant.

3rd East Lancashire Field Ambulance: Lieutenant Frank G. Prestwich, from Attached to Units other than Medical Units, to be Lieutenant.

1st Welsh Field Ambulance: Lieutenant John Clarke, from Attached to Units other than Medical Units, to be Lieutenant.

3rd Welsh Field Ambulance: Major John Livingstone, from Attached to Units other than Medical Units, to be Major.

1st Northern General Hospital: James Dunlop Lickley to be Lieutenant.

4th Scottish General Hospital: Willie Whitelaw to be Captain, whose services will be available on mobilisation.

3rd Southern General Hospital: Edward Walton Spencer Rowland to be Captain, whose services will be available on mobilisation.

2nd London Sanitary Company: To be Lieutenants: Arthur Errington Rayner and Lieutenant Arthur H. Savage, from 1st South-Western Mounted Brigade Field Ambulance.

1st London Casualty Clearing Station: Captain William S. Forbes, from the Unattached List for the Territorial Force, to be Captain.

Supernumerary for service with the Officers Training Corps: Temporary Major Archibald M. H. Gray to be Major.

Attached to Units other than Medical Units.—Surgeon-Major James P. S. Ward, from Devonshire Royal Garrison Artillery, to be Major. Captain Norman Maclaren to be Major. Surgeon-Captain Evan J. T. Cory, from the 5th Battalion, The Welsh Regiment, to be Captain. To be Lieutenants: Richard Payne Pollard and Charles Beresford Alexander.

VOLUNTEERS.

1st Cadet Battalion, The King's Royal Rifle Corps: Surgeon-Lieutenant William H. Davis resigns his commission (dated July 23rd, 1914).

DEATHS IN THE SERVICES.

Surgeon-General Arthur James Payne, I.M.S. (retired), on May 21st, at Onslow-gardens, London, in his 89th year. He attained the rank of surgeon-general in 1885.

ROYAL HOSPITAL FOR INCURABLES, DUBLIN.—Mr. G. Jameson Johnston, F.R.C.S.Irel., professor of surgery in the school of the Royal College of Surgeons, and senior surgeon to the Royal City of Dublin Hospital, has been elected consulting surgeon to the Royal Hospital for Incurables, in room of the late Sir John Lentaigne.

CATS AS A CAUSE OF DIPHTHERIA INFECTION.—An outbreak of diphtheria at the Stockwell Orphanage, in which, out of 68 cases, 1 proved fatal, has been traced to some infected cats in the Orphanage. The number of cases was larger among the boys than among the girls, which is accounted for by the fact that the boys, singularly enough, took more interest in the cats.

Correspondence.

"Audi alteram partem."

"CHARCOAL" OR "BINDING" WIRE FOR DRAINAGE TUBES.

To the Editor of THE LANCET.

SIR,—The memorandum on the treatment of the bacterial infections of projectile wounds in THE LANCET of April 24th makes special point of drainage. Rubber tubes which are in general use have been found efficient in civil surgery, whence the need for long-continued drainage has almost vanished; but where free and constant drainage of infected wounds is necessary the rubber tube does not fully meet the need; its imperforate walls permit the exit of fluids through the lumen of the tube only. Occlusion of this sole exit may arise, at the inner end of the tube, where it is liable to be blocked by the wall of the wound itself, by the flattening of the tube from natural pressure of the parts and from bandaging, or by angles which result from bending of the tube within the wound, or from fenestrating and so weakening the tube wall. Were infected wounds always hollow and cyst-like, a rubber tube might effectually drain them; but in the commoner case of irregular wounds whose inner walls fall together the drainage effected by a rubber tube may be but little more than would result from the use of a solid rubber cylinder.

To permit of exit and lavage, and no less of entrance for air and flushing, not only must the opening of the wound be free, but the walls within must be kept from falling together and so suffocating each other. The largest rubber tube which may be introduced can but keep apart those particular portions of the wound walls on which it lies, whilst the more tubes introduced the greater the area of rubber to press upon the raw and so impede both the weeping from it as well as the air getting to it.

Amongst the alternatives to rubber tubes for drainage wire has been suggested, though but little used in the last 20 years. The use of wire in strands or hanks is effective by capillary action, but the use of wire in tubes of open coiled spirals has further advantages. Suitable wire is of soft iron known as "charcoal" or "binding" wire; it is made in all gauges down to as fine as a hair; such gauges as 22–25–27 are suitable for coiling up into tubes; the higher the gauge number the thinner the wire; such wire costs, say, sixpence a pound or less by quantity. Charcoal binding wire has practically no spring; it is very easily bent and retains immediately the given bend. Nothing is used in the manufacture of binding wire which can harm an infected wound. A wire drainage-tube can be made of suitable size, shape, and flexibility on the spot in a couple of minutes, with no more elaborate tool than a lead pencil or a walking-stick, and a wise thumb. The tube of spirally-coiled wire can be bent to the shape of the wound; the gaps between the coils allow free entrance and exit of fluids and air to and from the wounded surfaces.

The gauge of the wire selected, the circumference of the wire tube and the amount of extension given to the spirals regulate the strength and flexibility of the tube. For example, coil two feet of gauge 27 wire round a lead pencil, press the coils up neatly together on the pencil, so forming

about half an inch of close wire tube of some 24 coils; withdraw the pencil and extend the tube to six inches, thus producing a tube of which the spirals are about a quarter of an inch apart; bend each of the sharp cut ends into a small closed eye and then turn back the eye itself into the lumen of the tube whence it cannot irritate the wound.

Spiral wire tubes can be rendered to any shape without the angling and occlusion which occur when rubber tubes are bent: such shapes as horse-shoe, squares, discs. The introduction of a wobbly spiral tube into a deep pocket is facilitated by mounting the wire tube upon a length of pliable lead or compo piping; the lead pipe, being bent as desired, is passed down inside the length of the wire tube and the open end of the lead pipe engages the eye at the further end of the wire tube. The extraction of a spiral-coiled tube from a wound may be facilitated by drawing on the end of the wire and at the same time twisting it a little in that direction which will coil the coils more tightly.—I am, Sir, yours faithfully,

Warwick-street, W., May 20th, 1915. FRANCIS H. POTT.

MENTAL TREATMENT BILL.

To the Editor of THE LANCET.

SIR,—The Early Mental Treatment Bill was "not proceeded with" on the day of its introduction, but I do not know that it has been definitely withdrawn; if not, there are several things in it that need explanation. In the first place, the title is misleading. The Bill does not propose to enact or legalise mental treatment, whether early or late. At first sight I took it to be a Bill to enforce matutinal treatment by Christian Science, and it occurred to me that a shorter and more appropriate title would be "Christians, Awake!" but it appears on perusal to be a Bill for legalising the temporary detention of persons in the early stage of mental disease.

I do not know, and I cannot learn from the text of the Bill, whether "nervous breakdown affecting the mental condition" and "mental breakdown" are intended to mean the same thing, or whether either or both of them mean the same thing as madness, lunacy, or insanity. Insanity was introduced as a euphemism for madness, but it has long gathered about itself the same implications, and is now as forbidding and stigmatising as madness itself. If nervous breakdown or mental breakdown is to be substituted for insanity it will very soon have precisely the same implications as insanity and madness and lunacy; but whether or not it means the same as these terms I think the Bill should make the meaning clear.

That the "mental condition" may be disordered without the disorder amounting to insanity is, or should be, a commonplace among those who treat mental disorders. There are very many mental disorders that are not insane, and such disorders are very frequent. Is this Bill intended to facilitate the treatment of such disorders? If so, it is unnecessary and uncalled for. Persons suffering from them can now legally "obtain residential treatment" without "being certified insane and sent to an asylum or hospital under the Lunacy Acts"—in fact, it would be impossible to certify them.

If, on the other hand, the Bill is intended to legalise the detention of insane persons under formalities less complicated, and safeguards not less assured, than those at present in force, there is much to be said for it; but whether this is or is not the intention should be made clear. No one but a German would lacerate unnecessarily the feelings of the unfortunate, but the intention of an Act of Parliament should be placed out of doubt, even at the cost of hurting people's feelings. If "nervous breakdown," "mental breakdown," and "mental disorder" mean insanity, they should be so defined in the Bill.

It is forgotten, but I think it should be remembered, that until the Lunacy Act, 1890, the procedure for placing a lunatic under control was much simpler and more ready than the procedure under that Act, and that during the 45 years that this simpler procedure was in force not one case of improper detention ever came to light. The Lunacy Act, 1890, was passed under the driving power of the popular feeling aroused by the attempt to place Mrs. Weldon under control as a lunatic. The attempt was not successful. Mrs. Weldon's liberty was not interfered with for one moment, but for the unsuccessful attempt the parties making it were very heavily fined, and some were ruined, by actions at law. That law thus proved its efficacy up to the hilt, and the plain lesson to be drawn from it was that no law could do more. However, in face of the fact that the existing safeguards had proved thoroughly efficient, public opinion demanded additional safeguards, and additional safeguards were enacted. These additional safeguards are not more efficient than the old—they could not be; but they have made the procedure for placing a lunatic under control more cumbrous, and more dilatory, and more difficult than it was before. The consequence has been that, whereas under the old law practically every lunatic whom it was desirable to certify was certified, and received all the benefits of the protective provisions of the law, under the new law a multitude of lunatics who ought to be certified are not certified, but are either at large, to the detriment of themselves, their families, and the public, or are illegally detained, or at least taken charge of, without any formalities or any legal safeguard.

If the opposition to what is miscalled the Early Mental Treatment Bill arises from an apprehension that it would facilitate the detention as lunatics of those who ought not to be so detained, it is misconceived and ill-directed. Its effect would be just the reverse. It is not true, as the memorandum of the Bill asserts, that "such patients can only obtain residential treatment if they are certified as insane and sent to an asylum." It is true that under these conditions only can they legally obtain such treatment, but, as has happened in so many other cases, the excessive stringency of the law has led to its evasion, and such patients do obtain residential treatment in violation of the law.

It is a mistake to suppose, as the memorandum seems to suppose, that nursing homes are deterred, by the need of certification, from receiving cases of mental disease. The ordinary medical and surgical nursing homes constantly do receive such cases, and do not recognise that the patients are certifiably insane until they become unmanageable or objectionable, and then the home is glad to get rid of a case that it is not fitted to undertake. The Bill will not, therefore, facilitate the treatment of such cases in the ordinary medical or surgical nursing home. What it will do is to legalise a half-way house between the free world and the lunatic asylum, a refuge from which many will return to the world without having to pass the portals of that unreasonably dreaded institution.

Anyone who is really concerned for the liberty of the subject, and does not merely cherish it as an obstructive fad, should work heart and soul for the passage of this Bill, and for the excision of the absurd clause which limits its operation to the period of six months after the conclusion of the war.

I am, Sir, yours faithfully,

Parkstone, Dorset, May 17th, 1915. CHAS. A. MERCIER.

THE MEDICAL DEFENCE UNION AND THE NATIONAL INSURANCE COMMISSIONERS.

To the Editor of THE LANCET.

SIR,—I see a letter in your last issue from Dr. A. G. Bateman, of the Medical Defence Union, stating that this body intends to challenge the right in the High Courts to surcharge practitioners who, in the opinion of their colleagues, represented by the panel committees, have prescribed extravagantly and improperly. As a member of the Medical Defence Union I shall strongly oppose any of the funds of that body being used for such a purpose. If Dr. Bateman had had the opportunity, as I have had, of seeing the extraordinary concoctions ordered by certain panel practitioners, the total disregard as to the cost, even when a drug with a similar therapeutic action is much cheaper, and the preference shown by some to drugs that are unknown to the general run of practitioner, and particulars of which are only to be found in advertisements, he would realise that it is absolutely necessary to have a check of some kind. In the insurance area of Bucks three-quarters of the doctors who prescribe are able to keep to the level of sevenpence per prescription, the other quarter are mostly at the eightpenny level and seldom above 1*s*.

Yet we know that in the London area the cost is much higher, and there is no doubt whatever in my mind that there are many men who are prescribing expensive medicines solely with a view of making the Act unworkable. If they succeed in doing so and have a State Medical Service they will only have themselves to thank for it.

It is sincerely to be hoped that an important body like the Medical Defence Union is not going to be captured by enemies of the Act.

I am, Sir, yours faithfully,

Buckingham, May 24th, 1915. ARTHUR E. LARKING.

DIFFICULT LABOUR AND DENTAL DEFORMITIES.

To the Editor of THE LANCET.

SIR,—I have no wish to enter into a discussion in your columns with Mr. F. Lonnon, but I should like to correct a false impression he conveys in his letter in THE LANCET of May 22nd that subsequent to his interviewing the mother of the patient my attention was attracted to the relationship of difficult labour to dental deformities. My interest in the question was long antecedent to the International Medical Congress. Still further, until Mr. Lonnon's letter appeared I was quite ignorant of the fact that he was working on the subject. I shall be grateful for any help from your readers, and I have no doubt that I shall be able to obtain sufficient material without Mr. Lonnon's help. Incidentally, I may say that in the case to which he has referred the condition was probably due to a developmental defect, and not to injury at birth.

I am, Sir, yours faithfully,

May 25th, 1915. J. F. COLYER.

THE ZEPPELIN THREAT: SURGICAL FIRST AID FOR THE METROPOLIS.

To the Editor of THE LANCET.

SIR,—With regard to the note appearing under this heading in your issue of May 22nd (p. 1104) it is important to remember that the work and organisation of the Committee of the Royal Society of Medicine, in consultation with and with the assistance of the War Office, deals chiefly with the East Coast from Dover to the Wash, and that it takes no responsibility for organisation in the metropolitan area, which is exclusively in the hands of the Commissioner of Police. Your notice suggests that certain steps suggested by the committee have been adopted and arranged for in the metropolis, but we have no knowledge that this has been done.

With regard to the metropolis, the committee has laid before the Commissioner a memorandum of suggestions for the organisation of surgical aid for London, but we have no right to assume that the Commissioner either heeded or adopted these suggestions. It has also provided the Commissioner of Police with a list of hospitals, infirmaries, and dispensaries willing to receive patients, and a map of London indicating the positions of these places, but the list did not include any extemporised emergency centres. Further, it has undertaken, if called upon by New Scotland Yard, to send surgeons, assistants, and anæsthetists to any point in the metropolitan area where their services are required, but only if summoned by the police.

We have no knowledge that copies of the map, which was prepared by Sir Rickman Godlee, Mr. Ernest Clarke, and Dr. H. Moreland McCrea, have been distributed to every police office, or that copies of the map can be supplied on demand.

Would you kindly allow me to add a personal note? You were good enough to say that the organisation has devolved upon myself, but this is only true in the limited sense that as honorary secretary of the committee I have endeavoured to the best of my ability to carry out its instructions. The Executive Committee, consisting of Sir Rickman Godlee, Bart. (chairman), Mr. C. A. Ballance, Mr. A. H. Cheatle, Mr. Ernest Clarke, Mr. E. M. Corner, Dr. J. C. Dunn, Mr. Edmund Owen, Mr. W. H. Clayton-Greene, Mr. G. J. Jenkins, Dr. Moreland McCrea, Mr. J. W. Thomson Walker, has been in every sense of the word a working committee, and has held numerous meetings here and at the private residences of its members, and the detailed work of arranging the list of receiving places, and corresponding with the officials has fallen almost entirely on Sir Rickman Godlee, the chairman of the committee.

I am, Sir, yours faithfully,

J. Y. W. MACALISTER.

Royal Society of Medicine, Wimpole-street, W., May 26th, 1915.

BAZETT *v.* THE LONDON INSURANCE COMMITTEE.

To the Editor of THE LANCET.

SIR,—This action was brought as a test action to raise the questions (1) whether "insuperable difficulty," such as the Committee alleges, is a legally justifiable answer—unless there is actual *physical* impossibility, uncontributed to by incompetence, and not merely *moral* impossibility aggravated by slack enforcement of provisions to meet it—to a

demand for the carrying out of an Act of Parliament; and (2) whether, if such insuperable difficulties really exist, resignation and not statute-tinkering is not the only honourable course for persons—especially if salaried—to whom impossible duties have been assigned; and to maintain that the breach of agreements on such a plea cannot destroy the right to damages. Under this particular Act it was hoped to establish that no apportionment of money for a year could be an adequate substitute for assignment of patients, but that, if it were the only alternative available, it had to be done by no "pro rata" rule of thumb—as inequitable a method as could well be conceived—but on the same principles of doing the best for patients and equalising the remuneration of doctors as would have guided common-sense persons in the legal distribution; and to claim that, taking the original date without power of alteration, every man then on the panel had his right both to a voice and to a share. Mr. Justice Darling suggested a compromise, which I did not accept, to my personal detriment, because it would have compromised my position as fighting for *principles* for all and not for mere cash for myself.

I was defeated, apparently, on the extraordinary contention, upheld by the judge in spite of my protests, that the doctors' complying with every detail the Committee might choose to demand, although it could not be found either in the Act or the Regulations, was a condition precedent to the obligation of the Committee to carry out the assignment of the doctorless persons, and that at the same time the gross errors in the doctors' lists which the Committee have made by the thousand were of little or no import, though they largely contributed to the difficulty of the assignment. I have succeeded, therefore—if this is left where it stands and where I, unaided, must leave it, I regret to say—only in showing that it is as useless for doctors to invoke the aid of our Courts of Justice as it is for them to trust to the word of honour of Insurance Committees or to the sense of equity of the Commissioners or to the pledges of the Government.

I am, Sir, yours faithfully,

HENRY BAZETT.

St. Mary's-terrace, Paddington, May 21st, 1915.

"DIFFERENTIAL DIAGNOSIS, PRESENTED THROUGH AN ANALYSIS OF CASES."

To the Editor of THE LANCET.

SIR,—In the review of Dr. R. C. Cabot's book with this title, which appears in THE LANCET of May 22nd, attention has been called to the fact that in the first volume the diagnosis is definitely stated at the conclusion of the consideration of each case, but that the same plan is not adopted in the second volume. In Vol. II. the diagnosis is given in the table of contents against the number of the case which appears in the body of the book. This change was made deliberately at the express request of a large number of subscribers to Vol. I., who pointed out that with the diagnosis printed at the end of the case and frequently catching the eye it deprived the reader of the mental training in diagnosis obtained by logical reasoning and led to the solving of the problem with the answer as a basis.

We are, Sir, yours faithfully,

W. B. SAUNDERS COMPANY.

Henrietta-street, W.C., May 21st, 1915.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE subscriptions received during the week include a cheque for £250 from the Agent-General for South Australia, on behalf of the South Australian Belgian Relief Fund. The continuance of open-handed support from the Colonies is a most gratifying feature, and accords thoroughly with the noble national spirit which the outlying parts of the Empire have displayed in every regard since the war began.

A handsome donation has been sent by the doctors and pharmacists of the city and county of Cork. The local committee spent a little money in judicious advertisement, and the cheque received amounted to £116 11*s.* 10*d.*

THE WEEK'S SUBSCRIPTIONS.

The subscriptions received by Dr. Des Vœux up to Tuesday evening last, in addition to those previously acknowledged, are as follows:—

	£	*s.*	*d.*
West London Medico-Chirurgical Society, proceeds from sale of tickets for Reception given on behalf of the Fund (per Dr. O. L. Addison, Hon. Sec.)	44	12	0
South Australian Belgian Relief Fund (per the Agent-General for South Australia)	250	0	0
Dr. A. Graydon	1	1	0
Dr. Barrs (collected by)—			
Dr. Radcliffe	1	1	0
Dr. Robertson	2	2	0
Dr. Spong	5	0	0
Dr. Woodcock	1	1	0
Warrington Division, B.M.A. (per Dr. J. A. Murray, Hon. Sec.)	2	2	0
Dr. C. J. Battle (per)—			
Dr. Morton, Dr. Wright, Dr. Battle, and A N Other	4	4	0
North of England Branch of Fund (per Dr. J. Don and Mr. A. S. Perceval, Hon. Secs.) (eleventh donation, total £516 13*s.* 6*d.*)—			
Dr. A. Fairlie	1	1	0
Dr. W. H. Dickinson	2	0	0
Dr. E. J. Burnett	1	1	0
Dr. H. W. Dixon	0	10	6
Fees for the Examination of Recruits by Members of the Sunderland Division during 1914—			
Dr. D. Allan	11	2	6
Dr. Blair Aitken	10	2	6
Dr. Gordon Bell	4	12	6
Dr. A. E. Legat	6	17	6
Dr. N. F. Rowstron	8	12	6
Dr. J. Chalmers	8	12	6
Dr. A. Campbell	17	0	0
Dr. S. E. Murray	11	10	0
Dr. Pearcey	14	5	0
Dr. R. S. Hubberstey	9	12	6
Dr. Easton	6	2	6
Dr. Renney	19	2	6
Dr. Raw	6	10	0
Dr. Blair	8	0	0
Dr. W. J. Woodburn	2	2	0
Dr. M. O'Brien	1	1	0
South-West Wales Division, B.M.A. (per Dr. D. R. Price, Hon. Sec.)	1	15	0
Dr. E. Hyla Greves (second donation)	5	5	0
West Bromwich Pharmaceutical Association (collected by) (per Mr. J. Rex Allen)—			
Mr. Griffiths, sen.	1	1	0
Mr. Griffiths, jun.	1	1	0
Mr. Withers	0	10	6
Mr. Barnes	0	5	0
Mr. Beattie	0	5	0
Mr. Bourne	0	5	0
Mr. Allen	1	1	0
Folkestone and District Chemists' Association (per Mr. F. C. Jones)	1	1	0
Mr. W. Riley, of Derby (collected by)—			
Mr. Judge	0	5	0
Mr. Evans	0	5	0
Mr. Wright	0	5	0
Mr. J. E. Owen	0	5	0
Newcastle and District Pharmacists' Association (collected by) (per Mr. W. Kerse)—			
Messrs. Wilkinson and Simpson	5	5	0
Messrs. Mawson and Procter	3	3	0
Messrs. Owen and Son	1	1	0
Mr. J. Stableforth Hill	1	1	0
Mr. T. H. Fleming	1	1	0
Mr. R. Wright	1	1	0
Mr. H. J. Bates	1	1	0
Mr. W. Kerse	1	1	0
Mr. H. S. Williamson	1	1	0
Mr. H. W. Noble	1	1	0
Mr. E. H. S. Baker	1	1	0
Mr. John Elliott	1	0	0
Mr. W. Clark	0	10	0
Mr. C. I. Russell	0	10	0
Mr. W. Stephenson	0	10	0
Mr. W. Atkins	0	10	0
Mr. T. M. Rutherford	0	10	6
Mr. J. F. Simpson	0	10	6
Mr. C. E. Layne	0	10	6
Mr. J. Todd	0	10	0
Mr. J. Corrigill	0	10	0
Mr. F. Beattie	0	10	6
Mr. E. G. Power	0	10	0
Mr. R. McClumpha	0	10	6
Mr. F. R. Parker	0	10	0
Mr. J. Kinnis	0	10	0
Mr. W. Kinnis	0	10	0
Mr. J. Elder	0	7	6
Mr. G. Whitehead	0	5	0
Mr. W. J. Smith	0	5	0
Mr. T. Robson	0	5	0
Mr. A. Turnbull	0	5	0
Miss Dunlop	0	5	0
Mr. E. H. Turnbull	0	5	0
Mr. B. Caley	0	5	0
Mr. A. D. Hunter	0	5	0
Mr. Doig	0	5	0
Mr. Poole	0	5	0
Mr. W. Buckley	0	5	0
Mr. R. Ismay	0	5	0
Mr. Weddle	0	2	6
Mr. Padley	0	2	6
Mr. J White	0	2	6
Mr. H. C. Bailes	0	2	6
A Friend	0	3	0
Dr. J. Gair Johnston*	1	1	0
Cork, City and County of, from Doctors and Pharmacists (total £124 19*s.*, less expenses £8 7*s.* 2*d.* £116 11*s.* 10*d.*)—			
Dr. D. D. Donovan	5	0	0
Dr. A. M. Sandford	5	0	0
Dr. P. T. O'Sullivan	5	0	0
Dr. C. T. Pearson	5	0	0
Dr. J. Cotter	5	0	0
Dr. H. R. Townshend	5	0	0

	£	s.	d.
Dr. Sir Bertram Windle	5	0	0
Dr. James J. Fitzgerald	3	0	0
Dr. R. H. Barter ...	3	3	0
Dr. M. C. McFetridge	3	3	0
Dr. J. Dunden	3	0	0
Dr. J. J. McMahon ...	3	0	0
Dr. J. J. Harding ...	3	0	0
Dr. A. E. Moore ...	2	2	0
Dr. N. J. Townshend	2	2	0
Dr. R. W. Hodges ...	2	2	0
Dr. M. Cagney	2	2	0
Dr. E. H. Montgomery	2	2	0
Dr. R. Crosbie	2	2	0
Dr. T. J. O'Meara ...	2	2	0
Dr. Col. F. McCartie, I.M.S....	2	2	0
Dr. A. E. Dixon	2	0	0
Dr. P. J. Cremen ...	2	0	0
Dr. T. Gelston Atkins	2	0	0
Dr. P. G. Lee	2	0	0
Dr. R. Barrett	1	1	0
Dr. J. B. Horgan ...	1	1	0
Dr. T. H. Denny Townshend	1	1	0
Dr. R. R. Leader ...	1	1	0
Dr. J. O'Connell... ...	1	1	0
Dr. Ashley Cummins	1	1	0
Dr. Robert Cummins	1	1	0
Dr. T. O'Callaghan ...	1	1	0
Dr. R. P. Byrne	1	1	0
Dr. H. Corby	1	1	0
Dr. J. Guisani	1	1	0
Dr. E. V. Cantillon ...	1	0	0
Dr. T. D. Barry	1	0	0
Dr. W. F. O'Connor ...	1	0	0
Dr. C. B. Pearson ...	1	0	0
Dr. P. J. Cullinane ...	1	0	0
Dr. P. Fitzgerald ...	1	0	0
Dr. R. C. Foott	1	0	0
Dr. D. McCarthy ...	1	0	0
Dr. W. K. Verling ...	1	0	0
Dr. T. J. O'Donovan...	1	0	0
Dr. T. P. Maguire ...	1	0	0
Dr. J. J. Kearney ...	1	0	0
Dr. J. J. O'Connor ...	1	0	0
Dr. D Morrisy	1	0	0
Dr. R. Morgan	1	0	0
Dr. P. J. Hayes	1	0	0
Dr. Col. Nicolls, R.A.M.C.	1	0	0
Dr. G Gwynne, Crosshaven	1	0	0
Dr. G Hegarty	1	0	0
Dr. D. F. Hegarty ...	1	0	0
Mr. E. McSweeney ...	1	1	0
Messrs. Kiloh and Co.	1	1	0
Mr. Ernest E. Wolfe...	1	1	0
Cork Chemical and Drug Co.	1	1	0
Mr. Thomas White ...	1	0	0
Mr. A. Nelson Cole ...	1	0	0
Mr. A. R. Lester... ...	1	0	0
Mr. D. Enright	1	0	0
Mr. and Mrs. Wilson...	1	0	0
Mr. A. H. Jones	1	0	0
Mr. R. Blair	1	0	0
Mr. W. Yeats	1	0	0
Mr. J. Scher...	1	0	0
Dr. Fielding...	2	2	0

* This donation was credited last week in error to the Stewartry of Kirkcudbright.

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham-gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Ltd.

THE APPEAL FOR SURGICAL INSTRUMENTS.

The Master of the Society of Apothecaries begs to acknowledge the receipt of surgical instruments kindly contributed by the following donors since the publication of the last list:—

Dr. A. M. Ware, Queen's Gate Gardens; Mr. J. W. McVitie, Hove, Sussex; and Dr. H. J. Starling, Norwich.

Instruments should be sent to the Apothecaries' Hall, Blackfriars, E.C.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Retirements in the Indian Medical Service.

Surgeon-General G. F. A. Harris, I.M.S., the Inspector-General of Civil Hospitals, Bengal, has retired after many years' service in India. His departure means the breaking of another link between the old school of sahibs and the present race of administrators, and he was held in as high esteem by the Indian population as by the European community. Surgeon-General Harris's family has been associated with India since 1749, when his great-grandfather came to India with a medical commission and died in the Hon. Company's service. His own connexion with India has been long and varied. His work in Bengal dates as far back as 1882, with interludes of work in the Central Provinces, the Re-united Provinces, and the Punjab. Many of the improvements in the Calcutta Medical College, of which he was formerly the head, are due to his suggestions, and all the assistant surgeons and sub-assistant surgeons are under a debt to him for his active steps in improving their pay, position, and prospects.

The retirement from the service is also announced of Lieutenant-Colonel R. H. Elliot, I.M.S., the distinguished ophthalmologist.

Victoria Caste and Gosha Hospital, Madras.

The annual report of the hospital has been laid before a general meeting of the governors and disclosed an unsatisfactory financial position, for the budget estimate for the current year showed an estimated deficiency of nearly Rs.6000. The managing committee of the hospital, the Countess of Dufferin Fund Committee, have recently adopted measures with a view of increasing the income and decreasing the expenditure, among others the introduction of a gradual scale of fees according to means of patients in the general wards with an income of Rs.50 or more per mensem.

Small-pox in Darjeeling.

The sanitary authorities at Darjeeling have been recently concerned over sporadic cases of small-pox. Each case was immediately segregated, and fortunately the disease was stamped out before it assumed epidemic proportions.

St. John Ambulance Red Cross Gifts.

The Indian branch of the St. John Ambulance Association has despatched close on £50,000 worth of Red Cross gifts to the hospitals at the various fronts and has received many appreciations from various sources, one of which is quoted here. Lieutenant-Colonel W. G. Pridmore, I.M.S., who is in command of No. 5 Indian General Hospital, Alexandria, writes as follows: "Before I left Karachi with No. 5 Indian General Hospital 50 ten-bed units of Red Cross gifts were handed over to me by your orders. My hospital is now opened out and ready and I have been able to unpack nearly all the St. John Ambulance Association gifts. These gifts have been, and are, most useful. If those who have laboured to make them could sometimes see the delight which the gifts give the wounded men they would be fully repaid for their trouble. On behalf of the wounded who are being and who will be treated in this hospital, I thank you and the kind people who have laboured to provide them most heartily. The articles which have been especially appreciated are mufflers, Balaclava caps, socks, rezais, blankets, and cigarettes."

Military Assistant Surgeons.

The Government of India have sanctioned the following redistribution of senior military assistant surgeons on the old presidential lists: Bengal, lieutenants 14, captains 14; Madras, lieutenants 2, captains 4; Bombay, lieutenants 7, captains 6; total 47. The necessary adjustment in the existing number of senior assistant surgeons in each presidency will be carried out in due course.

The Inspector-General of Civil Hospitals, United Provinces.

His Excellency the Viceroy has selected Lieutenant-Colonel C. Mactaggart, I.M.S., Inspector-General of Prisons, United Provinces, for the appointment of Inspector-General of Civil Hospitals, United Provinces, in succession to Colonel C. C. Manifold, I.M.S.

A Church Missionary Society Officer for France.

Mr. Arthur Neve, of the Church Missionary Society's Hospital, Kashmir, has accepted a post on one of the base hospitals for Indian troops, and has sailed from Bombay to take up his temporary duties. His brother, Dr. Ernest Neve, will remain in charge of the hospital at Srinagar.

April 24th.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear in the casualty lists published since our last issue:—

Killed: Captain F. M. Bingham, King's Own (Royal Lancaster Regiment) 5th T.F.; and Lieutenant G. M. Chapman and Lieutenant G. H. Lunan, both of the R.A.M.C.

Died of Wounds: Major W. P. Dillon, No. 2 Canadian General Hospital; Captain G. C. Glidden (attached 10th Battalion Western Canada Regiment), Canadian Army Medical Corps.

Wounded: Lieutenant W. Kelsey Fry, Lieutenant W. A. Stewart, Lieutenant P. W. James (from gas), Lieutenant A. C. Perry (attached 2nd Battalion Sherwood Foresters—from gas), Lieutenant J. R. Marrack (attached 1st Monmouth Regiment, T.F.), Captain H. F. Panton, Captain E. A. P. Brock (attached 2nd Royal Irish Fusiliers), Lieutenant P. Cagney (attached 2nd Essex Regiment), Lieutenant W. T. Quinlan, Lieutenant D. G. Watson, all of the R.A.M.C.; Captain H. S. Hollis, R.A.M.C. T.F.; Captain F. C. Bell, Major G. S. Mothersill, both of the Canadian Army Medical Corps.

Prisoner: Surgeon-probationer W. W. K. Brown, R.N.V.R.

DEATHS AMONG THE SONS OF MEDICAL MEN.

To the list given in our last issue of the sons of medical men who have fallen in the war must be added Captain P. Beattie-Crozier, only son of Dr. J. Beattie Crozier; Lieutenant R. E. J. Thomson, eldest son of Lieutenant-Colonel S. J. Thomson, C.I.E., I.M.S. (retired); Second Lieutenant T. F. Stocker, R.E., elder son of Surgeon-Major E. G. Stocker, R.E.; Captain H. de B. Riordan, only son of Colonel W. E. Riordan, R.A.M.C. (retired); Lieutenant R. H. Ackerley, eldest son of Dr. R. Ackerley, of Llandindrod Wells; Second Lieutenant Sidney Blair, son of Dr. John Blair, of Wigan; Captain R. C. C. Campbell, son of Colonel R. N. Campbell, C.B., C.I.E., I.M.S. (retired); and Lieutenant E. J. M. Robertson, son of Dr. J. R. S. Robertson, of Hayling Island.

THE PROSTHETIC SURGERY OF WAR IN GERMANY.

A Swiss correspondent writes:—"Professor Stoppany, the Director of the Zürich Dental School, who has just returned from a long stay in Germany, has published an interesting account of the way wounds of the mouth and face are now being treated there. If their condition permits, soldiers suffering from injuries to the mouth or face are conveyed, he says, to Strassburg, where they are treated in a special hospital organised and directed by Professor Römer. After mentioning that a large proportion of the wounds received in the trenches are those of the mouth and jaw, Professor Stoppany proceeds: 'The hospital which exists at Strassburg is the first that has ever been organised in any war for the treatment of wounds of the face and jaw. The staff numbers 55, and all the work (including the cooking), which is done by the wives and daughters of the professors, is performed without fee. The hospital itself is divided into two sections. In the first a dozen dentists examine the teeth of the soldiers, extract, and make plates. This work is carried out at the cost of the military authorities, who adopt the very reasonable point of view that a soldier with defective teeth cannot be thoroughly efficient. The remaining section of the hospital itself comprises two subdivisions—the operating theatre and the department in which are made the prosthetic moulds destined to replace the bones or sections of bone sacrificed in the operation, and the surgical work is entirely done by dentists, most of whom have taken their medical degree. The wounded are photographed and radiographed on their arrival and photographed before departure, and these photographs and radiographs will constitute a collection of the highest scientific interest.'

At the moment when Professor Stoppany left Strassburg more than 200 soldiers were undergoing treatment there, and the results already obtained were almost marvellous.

One other and not the least interesting point: Professor Stoppany is convinced that, contrary to allegations made some months back, no 'dum-dum' bullets have been used against the German troops."

EMPLOYEES OF LOCAL AUTHORITIES AND THE ARMY.

The Local Government Board have addressed a circular letter to the local authorities, dated May 21st, in which they say that in their previous circular of March 11th the necessity was pointed out for economising labour to the greatest extent possible, and, where substitutes are needed, for engaging only men who are not eligible for the army or suited for the special occupations in question. While acknowledging that many local authorities have recognised the importance of applying a similar principle in cases where vacancies arise in offices and employments, cases have come under their notice in which men who are eligible for the army or for the special occupations referred to have been selected to fill such vacancies, although it might have been possible to make some other arrangement. The circular continues:—

> The Board accordingly suggest that, whenever vacancies occur, and it is unlikely that candidates suitable for permanent appointment who are not eligible for the army or for special work in connexion with the war can be obtained, the local authority should consider first whether it would be possible by a rearrangement of duty among other officers to avoid any fresh appointment during the period of the war; and that if this should be found impracticable they should endeavour to secure the services of any retired officer with the requisite experience who might be able and willing to act during that period, or failing this should engage persons temporarily who are not eligible for the army or the special occupations as recommended in the previous circular in the case of substitutes.

It is recognised by the Board that persons so engaged may not always possess the same standard of qualification as would be required in the case of permanent appointments, but it can be made clear to them when engaged that the employment is only temporary, and that permanent appointments made after the war will be subject to all the ordinary conditions.

RED CROSS WORK IN EDINBURGH: A RÉSUMÉ OF MUCH WORK.—At the outbreak of war the Edinburgh Committee of the Red Cross Society recognised the importance of strengthening its organisation. A meeting presided over by the Lord Provost was held in the Council Chambers, when the general committee was reconstituted, and the followinng seven adjuvant committees were formed, with their respective conveners:

Finance (Councillor John Harrison), hospital accommodation (Professor H. H. Littlejohn), equipment (Mr. H. M. Rush), personnel (Mrs. Maxtone Graham), work parties and clothing (The Dowager Duchess of Abercorn), Samaritan (The Marchioness of Linlithgow), and transport (Sir M. Mitchell Thomson, Bart.). The Lord Provost is now making a further appeal for funds, which are required for general purposes, and particularly in the equipment and maintenance of hospitals, the provision of materials for clothing, and the maintenance of transport for the sick and wounded. In Edinburgh and its immediate vicinity 750 beds have now been provided in hospitals organised and staffed by the Red Cross Society, and these hospitals have been largely equipped by the equipment committee. The donors of the houses converted into hospitals have supplied a considerable part of the equipment and much of the clothing needed. A large number of patients from the front have now passed through these hospitals since the war began, in addition to Territorials. The military—i.e., first line hospitals—are provided in the Edinburgh district, with the exception of the Dalmeny House Hospital, entirely by the War Office, without imposing any burden on subscribers to Red Cross funds. The provision of the auxiliary hospitals is, at the request of the War Office, left to the efforts of the Red Cross Society. The contributions by the committee to the Scottish Hospital at Rouen have hitherto amounted to £400 a month.

The work parties and clothing committee at 42, Frederich-street cut out large quantities of material, and arrange for this being made into garments. At the music hall workers receive gifts of clothing and other articles, and pack and distribute them, and also make garments for which at the moment there is special need. There have been sent abroad in this way to various hospitals 49,000 articles, to hospitals at home over 17,600 articles, and to the navy 1280 articles. This does not include medical stores. The Edinburgh Committee has provided for work abroad nine ambulances, capable of carrying 36 stretcher cases, and has sent to our French allies three motor ambulances for 12 stretcher cases. In addition it has arranged for the transport of the sick and wounded at home. Since the beginning of the war 12,010 patients have been carried by Edinburgh ambulances and motor-cars. 1263 patients have been naval cases, of which 85 were German prisoners, mainly from the *Maintz* and *Blücher*. From the hospital trains over 1500 patients have been taken to hospital, while to auxiliary hospitals 1400 have been conveyed. From the camps in the Edinburgh district 4600 patients have been transferred to hospital. For this work the transport committee has provided four motor ambulances carrying 14 stretcher cases. There have been given for the period of the war three others carrying eight stretcher cases, while 16 motor ambulances, carrying 34 patients, have been lent—a total of 23 motor ambulances, capable of carrying 56 stretcher or lying-down cases at a time. The cost of providing the ambulances and maintaining and altering the plant has been £6072. In addition to this motor-cars to the number of 200 have been lent to the Edinburgh Transport Committee for the purpose of conveying sitting-up cases, as they are termed, to and from hospital.

THE ARMENIAN RED CROSS AND REFUGEE FUND.—An appeal, signed by Lady Henry Somerset, Lady Frederick Cavendish, Viscount Bryce, and the Dean of Manchester, has been issued asking for immediate assistance for the above fund. The appeal states that there are now in the field 10,000 Armenian volunteers fighting with the Russian Army, who have been equipped and maintained by Armenians all over the world at a cost of £6000 per day. It is estimated that there will soon be between 20,000 and 25,000 Armenians in the field, and at present they have no medical man, and there are only five untrained Armenian ladies assisting as nurses. Fifteen medical students from Kieff have gone to their assistance, but there are no Red Cross appliances of any sort, and these are urgently needed.

The civilian population is also sorely in need of medical aid. There are 12,000 Armenian refugees at Sarikamysch alone to be provided for, hundreds of old men, women, and children having tramped there through the snow without shoes or stockings, these articles having been seized by the Turkish soldiers, who in many instances drove the wretched people out as they entered the villages where they were billeted. The Armenian Society, composed of British and American people, is administering the Red Cross and Refugee Fund free of all cost, while the British Consul-General at Moscow is coöperating.

Donations of money may be sent to the honorary treasurer, Mr. H. A. Godson Bohn, at 17, Holland Villas-road, Kensington, or to the honorary secretary, Miss E. J. Robinson, at 35A, Elsham-road, Kensington.

THE RED CROSS IN MONTENEGRO.—Montenegro is being served for military medical purposes by the Montenegrin Red Cross and by two hospitals of 100 beds each established respectively by the British Red Cross and the Russian Red Cross. The Montenegrin Medical Service has now also 24 medical officers and 22 medical students distributed to the hospitals (from 60 to 100 beds) at Cettinje, Rondno, Nikchitch, Kalochine, Podgovitza, and elsewhere. There are army ambulances at various stations. The needs of Montenegro remain very sore, for typhoid fever is rife, and the population has been added to by an influx of refugees from Bosnia and Herzegovina. More medical men are needed who are prepared to offer their services voluntarily, and funds are urgently required. Contributions may be sent to the Duchess of Rutland, 16, Arlington-street, W., or to Lady Parkington, 58, Green-street, Park-lane, W.

The Red Cross ambulances which have been presented by various towns to London are to be reviewed as a fleet in July by Her Majesty the Queen.

THE KING GEORGE HOSPITAL.—This enormous hospital, whose medical, surgical, and special personnel we have already published, was opened without formality on Wednesday last, patients being received in a certain number of wards which had been prepared. An urgent message having been received by the committee that the hospital was, as far as possible, to be made ready for the reception of sick and wounded soldiers by May 26th, the first batch of resident medical officers entered into residence by that date, and the two top floors and the kitchens were placed in working order. The labours of organisation during construction have been considerable, as industrial questions with the workmen have periodically arisen.

As the result of the notice in THE LANCET four of the five microscopes which were wanted for work in the wards have been promised, the donors being Dr. Noel D. Bardswell, Midhurst; Mr. M. C. H. Moberly, Winslow, Bucks; Mr. W. F. Mellersh, Wimpole-street, London, and Mr. F. W. Edwards, Stanstead-road, Forest Hill, S.E.

The department for electro-therapeutic and massage treatment is now under the charge of Dr. T. Grainger Stewart, physician at the Queen-square Hospital for Diseases of the Nervous System.

QUEEN MARY'S CONVALESCENT AUXILIARY HOSPITALS.—Lady Falmouth and Mrs. Gwynne Holford ask us to state that Roehampton House, near London, will shortly be opened as a convalescent hospital for sailors and soldiers who have lost their limbs in the war. Mr. J. Pierpont Morgan also has offered Dover House, almost adjoining, for the use of officers. These houses together are capable of accommodating about 300 cases.

The Queen has consented to the hospitals being named "Queen Mary's Convalescent Auxiliary Hospitals," and has given a donation of £200. The scheme has also gained the patronage of Queen Alexandra, who, in sending a donation of £100, expressed her delight that the subject she had very much at heart was being taken up.

A strong committee has been formed, and the following is the list of the consulting staff: Mr. Thomas Openshaw, Mr. Robert Jones, Mr. R. C. Elmslie, Dr. Thos. J. Horder, and Dr. Theodore Thompson. At these hospitals the wounded who are admitted will be cared for until they have learned to use their artificial limbs, and are capable of taking up some employment, when, by working in conjunction with other societies, every effort will be made to fit the men to earn their living. Grants have been made to the hospitals by the National Relief Fund and the Red Cross Society, but a large sum is needed in addition for the equipment and maintenance. Communications and donations should be addressed to Mr. C. H. Kenderdine (marked Auxiliary Hospital), at St. Stephen's House, Westminster, who will be pleased to answer all inquiries.

VACANCIES FOR MEDICAL OFFICERS.—We are asked to state that there are three vacancies for officers in the 2nd Line and two in the 3rd Line, South Wales Mounted Brigade Field Ambulance, the former of which will be going into camp at an early date. Particulars can be obtained from Lieutenant-Colonel Herbert Jones, The Barracks, Hereford.

There are also vacancies for medical officers (carrying commissions as lieutenants R.A.M.C. T.) in the 3rd (Foreign Service) Line 3rd East Anglian Field Ambulance. Enquiries and applications should be addressed to the Officer Commanding, 3/3 East Anglian Field Ambulance, Walthamstow, London, E.

There are also vacancies for five medical officers prepared to serve abroad in the 2nd and 3rd Line Welsh Border Mounted Brigade Field Ambulance. Pay and allowances as in the Regular Army, together with outfit and camp kit grants. Full particulars can be obtained on application to Officer Commanding, 2nd Line Welsh Border Mounted Brigade Field Ambulance, Lambton Park Camp, co. Durham.

WOUNDED ALLIES RELIEF COMMITTEE AND SERBIA.—The Wounded Allies Relief Committee has received a most satisfactory account of the typhus hospital at Kragujevac from Dr. Lauwens, the medical officer in charge, who reports that the building provided by the Serbian Government is spacious, clean, and in all ways suitable; that the unit has received the utmost attention from the Serbian Government; and that the typhus epidemic is already declining, a total of 20,000 cases in March having dropped in April to 12,000. He further relates the safe arrival of the committee's motor ambulance, to be used, at first, for the transport of infectious cases. The committee is shortly dispatching to Serbia, to the Kragujevac Hospital, four R.C.H. touring cars, for the transport of the wounded, and their comparative lightness will be of great advantage on the heavy Serbian roads. The committee also appeals to the British public to supply the Serbian sick and wounded with boots and overcoats. As the typhus epidemic is already on the decline, the Kragujevac unit will shortly be adapted for purely surgical purposes. Dr. Lauwens urgently asks for surgical instruments, dressing materials and bandages, disinfectants, iodine, &c. Gifts in kind should be addressed to the Committee at Sardinia House, Kingsway; money to the honorary treasurer, Mr. T. O. Roberts (manager), London County and Westminster Bank, 217, Strand, W.C.

MILITARY HOSPITAL ACCOMMODATION IN ABERDEEN.—For some time past negotiations have been in progress between the military authorities and the Aberdeen parish council with a view to the transference of Oldmill Poorhouse to the former, to be used at a hospital. The City of Aberdeen Territorial Association has now received instructions from headquarters to take over the Poorhouse, the parish council being allowed a certain period within which to remove the inmates. The Poorhouse was originally licensed to receive 967 patients, but by using sitting-rooms as wards it should be capable of accommodating over 1000 beds. It is calculated that the taking over of the institution will result in a gain to the Scottish General Hospital of some 550 beds.

THE BRITISH FIRE PREVENTION COMMITTEE AND THE WAR EMERGENCY.—The following particulars show the work done by the British Fire Prevention Committee (3, Waterloo-place, London, W.) during the first nine months of the war. The committee's special fire-survey force of honorary surveyors have surveyed in detail 500 establishments taken over for war emergency work, including extensive groups of buildings, such as auxiliary military hospitals. In each case the honorary surveyors' reports, which are prepared on special lines and accompanied by sketch plans, serve as a basis for the detailed written reports to the authorities concerned prepared at the committee's London headquarters. A warning service has issued a large number of public "fire warnings" in the form of posters, over 25,000 of which have been issued to auxiliary hospitals at home, in France, in the Mediterranean, and in Egypt, as also translations in French, Flemish, Urdu, and Panjabi. The issue of posters involved not only a careful distribution with directions, but also resulted, as a rule, in correspondence on technical points. Authorities and public corporations receive the posters free upon written application to the registrar of the committee. "Warnings" have also been issued to factories and workshops engaged on Government supplies in respect to air raids. A special fire-service force has been organised by the committee, comprising ex-fire-brigade officers and firemen, and 200 firemen with the necessary appliances are available for mobilisation in sections within 48 hours. Calls upon this force have so far only been made to a moderate extent for fire patrols. The work in each department has been carried out by the honorary officers of the committee and a small clerical staff without materially interfering with the routine work of the organisation. The Committee have recently issued some valuable hints on fires arising from air-raids, and they may be warmly congratulated upon their public service.

PROHIBITED EXPORTS. — The Privy Council, under its powers to supplement or vary, whilst a state of war exists, and on the recommendation of the Board of Trade, any Proclamation or Order dealing with goods for exportation, has prohibited the exportation to all destinations of crude coal tar, and to all destinations other than to British possessions and protectorates the following drugs and chemicals—magnesium chloride, oxides and salts of cobalt, oxalic acid, phosphorus, and all forms of aluminium.

St. Thomas's Hospital is preparing to enlarge the accommodation there provided for wounded and sick soldiers by 300 extra beds, which are to be placed in huts now under construction.

THE Royal Insurance Company, Liverpool, and the Liverpool, London, and Globe Insurance Company have each presented to the Liverpool Civic League a fully equipped motor ambulance for the transport of wounded soldiers to the Liverpool hospitals.

Medical News.

BOARD OF THE ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH AND THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At examinations held recently the following candidates were successful:—

First Examination.—Robert Austin, Joseph Black, Apcar Galustian, Francis Xavier Hayes, Donald Leslie Henderson, Robert Alexander Chermside Pooley, Sidney Hill Waddy, and Robert Wilson.

Second Examination.—Philip George Bainbridge, Alexander Balfour Black, Donald M'Kenzie Black, James Calder, Jean M'Murray Crawford, Robert Phillips Crawford, Reginald Douglas Howat, William Jackson, Reginald John Thomas Malcolm-Gasper, Joseph Michaelson, Patrick Aloysius O'Brien, and Samuel Sloan.

Third Examination.—John Carden Bedwell, William Campbell Borrie (with distinction), Kaikhasru Sorabji Bhiwandiwalla, William Brown, John George Buchanan, Harry Ellison, Owen Glendower Evans, John William Irvine, William Paterson Hay Lightbody, James Young M'Lean, H. Morley, and Charles Edward Stuart Runciman.

Final Examination.—Frederick Arthur Vere Denning (with honours), John Walker, George Thomson, John Mellon Smeaton, Stewart Newnham Toulmin, Wilson Thabo Mongoli Sebeta, Victor Albert Goonetilleke, John Scott, William Pigg Over, and Thomas Ross Scott.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—C. D. Banes (Section II.), King's College Hospital; A. U. L. Bennett (Sections I. and II.), Royal Free Hospital and Birmingham; H. A. De Morgan (Sections I. and II.), Middlesex Hospital; C. S. Dodson (Sections I. and II.), University College Hospital; J. C. Lee (Section I.), McGill, and L. N. Lee (Section II.), Geneva; H. B. Padwick (Sections I. and II.) and M. C. Stark (Section I.), London Hospital; and T. J. Thomas (Section I.), King's College Hospital.

Medicine.—W. Bailey-Thomson (Section II.), Aberdeen; J. A. A. Boddy (Section I.), Manchester; A. Butterfield (Section II.), Durham; W. Fox (Section II.), Charing Cross Hospital; J. C. Lee (Sections I. and II.), McGill; W. F. Matthews (Section I.), King's College Hospital; S. Rawlinson (Sections I. and II.), Manchester; and A. H. Taymour (Sections I. and II.), Guy's Hospital.

Forensic Medicine.—L. M. Arnold, Cambridge and St. Mary's Hospital; A. Z. Abushady, St. George's Hospital; L. S. Goss, Middlesex Hospital; J. C. Lee, McGill; I. H. Lloyd, Westminster Hospital; A. H. Taymour, Guy's Hospital; and T. J. Thomas, King's College Hospital.

Midwifery.—L. M. Arnold, Cambridge and St. Mary's Hospital; A. Butterfield, Durham; F. W. Chamberlain, Middlesex Hospital; K. M. Dyott, London Hospital; and J. C. Lee, McGill.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: C. D. Banes, A. U. L. Bennet, C. S. Dodson, L. N. Lee, H. A. DeMorgan, and H. B. Padwick.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held recently the following gentlemen were admitted Fellows:—John Coffey, L.R.C.S. Edin. (triple qualification), Dublin; Norman Grenville Walshe Davidson, L.R.C.S. Edin. (triple qualification), Wolverhampton; Andrew Graham, L.R.C.S. Edin. (triple qualification), China; Garnet Reginald Halloran, M.B., Ch.M. Univ. Sydney, London; George Laurence, M.R.C.S., L.R.C.P. Lond., Chippenham; Joseph Currie Lorraine, M.B., Ch.B. Edin., Burma; and Vernon Laurie Miller, M.D., C.M. McGill Univ., Halifax, Canada. The bronze medal and microscope presented to the College by Colonel William Lorimer Bathgate, in memory of his late father, William McPhune Bathgate, F.R.C.S. Edin., lecturer on materia medica in the Extra-Academical School, was awarded, after the usual competitive written examination, to Mr. James Hood Neill, Edinburgh.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee 15 cases were considered and grants amounting to £104 voted to 12 of the applicants. The following is a summary of the cases relieved:—

Daughter, aged 59, of M.R.C.S. Eng. who practised at Liverpool. Until the war broke out managed to earn a living as a teacher of singing, but practically all her teaching work has ceased. Has an invalid brother partly dependent on her. Voted £10 in two instalments.—Widow, aged 52, of M.B. Aberd. who practised at Watlington, Oxon. Left totally unprovided for at her husband's death after a long illness. Has one son who is an invalid. Relatives allow her £5 per month, but this is not sufficient to provide all that is required for herself and son, and applicant unable to work. Voted £10 in two instalments and referred to the Guild.—M.R.C.S. Eng., aged 77, who practised at Manchester and Brighton. Has been in failing health for some years, and is partially blind and suffering from right hemiplegia. Only income the Old Age Pension. Has one daughter, who has had to give up her situation to nurse her father. Voted £18 in 12 instalments, and referred to the Guild.—Daughter, aged 60, of L.R.C.P. Edin., who practised at Cheadle, Cheshire. Health very indifferent and unable to undertake regular employment. Only income £30 per annum. Relieved nine times, £76. Voted £12 in 12 instalments.—Daughter, aged 64, of M.D. St. Andrews who practised at Dover. Has a sister and niece dependent on her. Resides at seaside town and takes in paying guests but recently had difficulty in obtaining them. Relieved once, £10. Voted £10.—Daughter, aged 64, of M.R.C.S. Eng. who practised at Derby. Health very indifferent for many years. Only income £5 per annum from a friend. Lives with a sister who provides her with a home. Relieved five times, £60 Voted £12 in 12 instalments.—Daughter, aged 66, of M.R.C.S. Eng. who practised at Durham. Has been an invalid for years and unable to leave her bed and practically blind. Only income a pension from another charity. Relieved three times, £30. Voted £5.—Wife, aged 49, of M.R.C.S. Eng. Deserted by husband. Has one daughter, who was a governess, but has lost her employment in consequence of the war. Applicant very delicate. Only joint income recently 10s. per week. Relieved twice, £14. Voted £12 in 12 instalments.—Widow, aged 68, of M.R.C.S. Eng. who practised in Jamaica. Has three married sons, but none able to help. Only income £26 per annum from another charity. Too old to work. Relieved twice, £20. Voted £12 in 12 instalments and referred to the Guild.

Also three emergency grants of £1 each pending further inquiries. Six additional annuitants at £20 each were also elected, making the total number 148. Subscriptions may be sent to the honorary treasurer, Dr. Samuel West, 11, Chandos-street, Cavendish-square, W.

Mr. Neil McLeod, who died suddenly at his residence, Whitehall, Drighlington, near Bradford, on May 12th, was the medical officer and public vaccinator for the fourth district of the North Bierley union, and had a large local practice.

Parliamentary Intelligence.

HOUSE OF COMMONS.

THURSDAY, MAY 13TH.

The War and Elementary Education.

Sir HENRY HIBBERT spoke of the excellent results obtained from the medical inspection of elementary school children. He was afraid that that inspection might have to be stopped or greatly curtailed during the war. In his own county (Lancashire) there was a permanent staff of 13 doctors, of whom 10 had gone to the war. Three of them were serving under the Serbian Government. Two other medical men on their staff were going, and that would leave them with one. They had 26 nurses and 18 had gone. They expected two to go almost any day. He did not see what could be done in the matter because it was absolutely impossible to engage fresh medical men.

Dr. ADDISON (Parliamentary Secretary to the Board of Education) said that the Government now contributed a share to the medical inspection of school children, whereas formerly the cost fell upon the local authorities. Many authorities were now working with greatly reduced medical staffs. As to the use of schools for military hospitals, he had been round the country with a committee making provisional arrangements. In Liverpool and other places they visited with the local authorities all available buildings which were anything at all likely to be suitable, and their anxiety was to spare school children from dislocation and disturbance where possible. It had been suggested that chapels should be used for hospitals. A chapel was very seldom a suitable place. A place was wanted where a man lying on a bed could see out of the window and get a glint of sunshine, and it often happened with chapels and halls and such-like buildings that they only had windows high up, so that a man lying on a bed in the middle of the floor would see the light come in from above. Such buildings would not make suitable hospitals. All these considerations had been taken into account, and it was not with any avidity that the Board of Education consented to the use of schools as hospitals. It was found advisable by the Army Council to have a committee on this matter, and make a comprehensive scheme in case great numbers of beds were needed. The various local authorities coöperated with the committee in every way, and it was found quite possible by friendly negotiations in all the great cities visited to arrive at a scheme, and, notwithstanding the criticisms from outside, arrangements were made which he thought would be found to meet the full requirements of the case and cause as little disturbance and friction as possible. Arrangements for 1500 beds could not have been made without disturbing someone.

Mr. PEASE, replying to a question relating to physical education, said that the Board of Education had recently had appointed two or three extra inspectors in connexion with physical training, men who had studied the subject and had passed tests in Sweden or elsewhere, to go round the country and see that the best system of physical training was adopted in schools. They were to examine the curriculum of the school and to see that as much attention as possible, having regard to the other interests of the school, was given to physical training and exercise. He believed that more could be done, especially in connexion with the first few minutes of the school day. In many of the schools the first ten minutes were given to breathing exercises and to certain simple exercises in addition to the regular period set apart of from 20 to 40 minutes for physical training. A real advantage would thus be secured by the children. Physical exercise was being made a compulsory subject in all the training colleges.

WEDNESDAY, MAY 19TH.

Consulting Surgeons' Service with the Army.

Mr. JOYNSON-HICKS asked the Financial Secretary to the War Office whether the following surgeons, Sir G. H. Makins, K.C.B., Sir A. A. Bowlby, C.M.G., Mr. F. F. Burghard, Mr. W. T. Lister, Mr. H. M. W. Gray, and the following physicians, Sir W. P. Herringham, Sir A. E. Wright, Sir J. R. Bradford, and Sir B. Dawson, K.C.V.O., were employed at the front at ordinary Royal Army Medical Corps salaries; and whether he had any difficulty in getting eminent doctors to serve in consulting positions either abroad or at home at the ordinary rates of pay given to the officers of the Royal Army Medical Corps.—Mr. H. BAKER replied: The officers named are employed at the front with pay as colonels of the Army Medical Service, and so far there has been no difficulty in obtaining eminent medical men to serve in consulting positions either at home or abroad at the rate of pay offered.

Medical Men and War Service.

Mr. GINNELL asked the President of the Local Government Board to state the number of medical officers of local administrative bodies in England and Wales who had volunteered for service in the present war, the number of them serving, and the treatment of them by those bodies generally in regard to continuance of salary, payment of substitute, and keeping their positions vacant for them.—Mr. HERBERT SAMUEL (in a written reply) answered: The number of medical officers of health serving with the naval or military forces, so far as the Local Government Board know, is 171, and the number of tuberculosis officers and assistant tuberculosis officers so serving is 52. I have no information as to the number of officers who have volunteered but are not serving. A large number of assistant medical officers of health, superintendents of isolation hospitals, Poor-law medical officers, and school medical officers are also serving. Generally speaking, local authorities pay such officers during their absence the difference between their civil pay and their navy or army pay, keep their positions vacant for them, and appoint temporary substitutes where necessary.

Mr. GINNELL asked the Chief Secretary to the Lord Lieutenant a similar question in regard to the medical officers of local administrative bodies in Ireland.—Mr. BIRRELL

furnished the following written reply: About 26 or 27 Poor-law medical officers have been granted leave of absence to join the Army Medical Service. Their positions will be kept open for them. In some cases the guardians are paying the medical officer his salary and also paying the substitute. In others the salary is paid to the temporary substitute only.

Disabled Soldiers.

Replying to Mr. ELLIS GRIFFITH, Mr. H. BAKER (Financial Secretary to the War Office) wrote: A wounded soldier considered to be permanently unfit for further service is brought before a medical board, and may be discharged from the service before complete convalescence is attained. He can, however, remain in hospital as a free patient until it is considered advisable that he should leave, and during this period he draws any pension or disability pension awarded him. All insured soldiers while suffering from disability are entitled on discharge from the service to full benefit under the National Insurance Act, except that, as provided by the Select Committee on Pensions, sickness and disablement benefits are reduced by 5s. a week for men who are drawing the total disability pension at the new rate.

National Insurance Payments to Medical Men.

Mr. BRIDGEMAN asked the Chancellor of the Duchy why it was that medical men were not paid each quarter the full amount due to them under the National Insurance Act; what means doctors had of recovering arrears due to them; and why in the border parishes they received mileage pay on the Welsh side but not on the English side for patients distant more than three miles.—Mr. MONTAGU wrote in reply: In answer to the first part of the question, the remuneration due to practitioners on the panel under their agreements with Insurance Committees is ascertainable annually and not quarterly. The quarterly payments are advances on account of remuneration which cannot be determined until the close of the year, and no quarterly settlement is therefore practicable. As regards the latter part of the question, the distribution of any mileage grant among the doctors in any particular area is largely a matter for the doctors themselves. If, however, the honourable member has in mind any particular case, I should be pleased to make inquiries.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BOYCOTT, ARTHUR E., M.D. Oxon., F.R.S., has been appointed Director of the Graham Research Laboratory.

EWAN, J. A., M.D. Edin., has been appointed Temporary County Medical Officer of Health for Kesteven.

GEMMELL, A. C., M.B., B.C. Cantab., M.R.C.S., L.R.C.P. Lond., has been appointed Resident Medical Officer to the Red Cross Hospital, Ampton Hall, Bury St. Edmunds.

JONES, PETER, M.D. Edin., has been appointed Medical Officer of Health for the Abergele and Pensarn Urban District.

KELLEHER, T. A., M.B., B.Ch. R.U.I., has been appointed Temporary Medical Officer of Health to the Waterford and New Ross Port Sanitary Authority.

SHORLAND, W., L.R.C.P. Edin., M.R.C.S., has been appointed Medical Officer and Public Vaccinator for Brixton Ferry and Baglan Lower.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRKENHEAD BOROUGH HOSPITAL.—Female Senior and Junior House Surgeons. Salary £180 and £150 per annum respectively, with board and laundry.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £250 per annum, with apartments, attendance, &c.

BOLTON INFIRMARY AND DISPENSARY.—Third House Surgeon. Salary £170 per annum, with apartments, board, and attendance.

BRIGHTON COUNTY BOROUGH ISOLATION HOSPITAL.—Resident Medical Officer. Salary £200 per annum, with board and lodging.

BRISTOL, BISHOP'S KNOLL HOSPITAL (2ND SOUTHERN GENERAL HOSPITAL), Stoke Bishop.—Surgeon in Residence. Salary £250 per annum, with board, lodging, and laundry.

BRISTOL GENERAL HOSPITAL.—House Surgeon and Casualty House Surgeon, both for six months. Salary at rate of £150 per annum, with board, residence, &c.

BRISTOL ROYAL INFIRMARY.—Throat, Nose, and Ear House Surgeon for six months. Salary at rate of £120 per annum, with board, apartments, and laundry.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £135 per annum, with residence, board, and washing.

BURY INFIRMARY.—Senior and Junior House Surgeons. Salary £175 and £150 per annum respectively, with board, residence, and washing.

BUXTON, DERBYSHIRE, DEVONSHIRE HOSPITAL.—Assistant House Physician for six months. Salary £100 per annum, with apartments, board, and laundry.

CAMBRIDGE, ADDENBROOKE'S HOSPITAL.—Honorary Assistant Surgeon for Ear, Nose, and Throat Department. Also Honorary Assistant Surgeon for Ophthalmic Department.

CARLISLE NON-PROVIDENT DISPENSARY.—Resident Medical Officer. Salary £200 per annum, with apartments (not board).

CARMARTHEN, JOINT COUNTIES ASYLUM.—Temporary Second Assistant Medical Officer. Salary at rate of £200 per annum, with board, lodging, washing, &c.

DENBIGH, NORTH WALES COUNTIES ASYLUM.—Second Assistant Medical Officer. Salary £300 per annum, with apartments, board, attendance, and washing.

EALING, BOROUGH OF.—Medical Officer of Health and School Medical Officer. Salary £700 per annum.

EDINBURGH, ROYAL ARMY MEDICAL CORPS DEPÔT, Easter-road Barracks.—3RD LOWLAND FIELD AMBULANCE: Commissions.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E.—House Physician for five months. Salary at rate of £75 per annum, with board, residence, and washing.

EXETER, ROYAL DEVON AND EXETER HOSPITAL.—House Physician for six months. Salary at rate of £150 per annum, with board, apartments, and washing.

GREAT MISSENDEN, BUCKS.—3RD/2ND SOUTH MIDLAND MOUNTED BRIGADE FIELD AMBULANCE (T.): Two Medical Officers. SANITARY SECTION, 2ND/1ST SOUTH MIDLAND DIVISION: Medical Officer.

HARROGATE INFIRMARY.—Resident House Surgeon. Salary £100 per annum.

LEEDS CITY.—Medical Assistant in Public Health Department. Salary £350 per annum.

LEICESTER ROYAL INFIRMARY.—Resident Medical Officers. Salary as arranged.

LIVERPOOL, HIGHFIELD MILITARY HOSPITAL, Knotty Ash.—Resident Assistant Medical Officer. Salary at rate of £300 per annum, with rations and apartments.

LIVERPOOL, ROYAL SOUTHERN HOSPITAL.—Honorary Assistant Laryngologist for Ear, Nose, and Throat Department.

MANCHESTER, COUNTY ASYLUM, Prestwich.—Assistant Medical Officer, unmarried. Salary £250 per annum, with board, apartments, attendance, and washing.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—House Surgeon. Salary £120 per annum, with apartments and board.

NEWCASTLE-UPON-TYNE, POOR-LAW INSTITUTION AND INFIRMARY, Westgate-road.—Assistant Resident Medical Officer, unmarried. Salary at rate of £250 per annum, with apartments, rations, and washing.

NORTHAMPTON COUNTY BOROUGH.—Temporary Clinical Tuberculosis Officer. Salary £350 per annum.

NORTHUMBERLAND, CHILDREN'S SANATORIUM, Stannington.—Female Resident Medical Officer. Salary £200 per annum, with board and washing.

NOTTINGHAM CHILDREN'S HOSPITAL.—Female House Surgeon. Salary at rate of £150 per annum, with apartments, board, and washing.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.—Temporary Surgeon in Charge of Out-patients.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Surgeon. Salary as arranged, with board, residence, and washing.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £125 per annum, with board, lodging, and washing.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Two Resident Medical Officers to Military Block.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W.—Resident Medical Officer.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Plaistow, E.—Resident Medical Officer and Assistant Resident Medical Officer. Salary at rate of £110 and £90 per annum respectively, with board, residence, and laundry.

SALISBURY GENERAL INFIRMARY.—House Surgeon and Assistant House Surgeon, unmarried. Salary £150 and £100 per annum respectively, with apartments, board, lodging, and washing.

SCARBOROUGH HOSPITAL AND DISPENSARY.—Senior and Junior House Surgeons. Salary £100 and £80 per annum respectively, with board, residence, &c.

SHEFFIELD, ECCLESALL BIERLOW UNION.—Resident Assistant Medical Officer. Salary £350 per annum, with board, washing, and apartments.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN (GYNÆCOLOGICAL AND MATERNITY DEPARTMENTS).—Female Junior House Surgeon, unmarried. Salary £80 per annum, with board, residence, and laundry.

SHEFFIELD ROYAL INFIRMARY.—House Surgeon and Assistant House Physician. Salary £100 per annum, with board and residence.

SHEFFIELD, WHARNCLIFFE WAR HOSPITAL, Middlewood-road.—Resident Medical Officers.

SHREWSBURY, ROYAL SALOP INFIRMARY.—House Physician. Salary at rate of £110 per annum, with board and apartments.

SIDLAW SANATORIUM.—Resident Medical Officer. Salary £200 per annum.

SINGAPORE, STRAITS SETTLEMENTS.—Resident Medical Superintendent for Infectious Diseases Hospital. Salary 4200 dollars for first, 4500 dollars for second, and 4800 dollars for third year, with free quarters.

SOUTH SHIELDS, INGHAM INFIRMARY AND SOUTH SHIELDS AND WESTOE DISPENSARY.—Female House Surgeon. Salary £150 per annum, with residence, board, and washing.

STROUD GENERAL HOSPITAL.—House Surgeon. Salary £120 per annum, with board, lodging, and washing.

SWANSEA GENERAL AND EYE HOSPITAL.—House Physician. Salary £125 per annum, with board, apartments, and washing.

TINGWALL, WHITENESS, AND WEISDALE PARISH.—Medical Officer and Public Vaccinator. Salary £45 per annum.

VENTNOR, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Isle of Wight.—Assistant Resident Medical Officer.

WALSALL AND DISTRICT HOSPITAL.—Assistant House Surgeon and Anæsthetist. Salary £150 per annum, with board, residence, and laundry.

WEST BROMWICH AND DISTRICT HOSPITAL.—House Surgeon and Assistant House Surgeon, unmarried. Salary £150 and £120 per annum respectively, with residence, board, and laundry.

WESTERN GENERAL DISPENSARY, Marylebone-road, N.W.—Honorary Ophthalmic Surgeon.

WEST HAM AND EASTERN GENERAL HOSPITAL.—Resident Medical Officer. Salary £160 per annum. Also House Physicians. Salary £120 and £100 per annum, with board, residence, and washing.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Junior House Surgeon. Salary £150 per annum, with board, apartments, and washing.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—Resident Medical Officer and House Surgeon for six months. Salary at rate of £150 per annum, with board, rooms, and laundry.

WORCESTER GENERAL INFIRMARY.—Resident Medical Officer. Salary £150 per annum, with board, residence, and washing.

WREXHAM INFIRMARY.—Resident House Surgeon. Salary £125 per annum, with board, lodging, and washing.

YORK RETREAT.—Junior Assistant Medical Officer. Salary £200 to £225 per annum, with board, lodging, &c.

Births, Marriages, and Deaths.

BIRTHS.

BRODRIBB.—On May 21st, at Pevensey-road, St. Leonards-on-Sea, the wife of Arthur W. Brodribb, M.A., M.B., L.R.C.P., of a son.

CUNNINGHAM.—On May 18th, at Gwynfa, Llandrindod Wells, the wife of J. B. Cunningham, M.B., Ch.B., of a daughter.

GLENN.—On May 19th, at Merrion-square, Dublin, the wife of John H. R. Glenn, M.D., of a son.

MASEFIELD.—On May 20th, at "Tolima," Trentham, Staffs, the wife of W. Gordon Masefield, M.R.C.S., L.R.C.P., of a son.

TAYLOR.—On May 18th, at La Jaspellerie, Sark, Channel Islands, the wife of Ashby Taylor, Medical Officer of Sark, of a daughter.

MARRIAGES.

GILLON—HUTCHISON.—On May 19th, at St. George's, Hanover-square, Lieutenant-Colonel G. Gore Gillon, F.R.C.S. Edin., R.A.M.C. (temp.), late New Zealand M.C., to Jean Frances Hutchison, widow of Joseph Hutchison, of Woodside, Lanarkshire.

LEE—GOMPERTZ.—On May 21st, in London, James Carrel Lee, M.D., McGill University, Montreal, son of Mr. and Mrs. Lee, of Quebec, Canada, to Ethel Gompertz, M.B. Glasg., daughter of Colonel and Mrs. Gompertz, of Teignmouth, Devon.

WILSON-SMITH—LAWES.—On May 18th, at St. Mark's Church, Regent's Park, London, Lieutenant William Arthur Wilson-Smith, M.D., R.A.M.C., to Dorothea Grace, second daughter of Mr. and Mrs. J. Edward Lawes, Woodford House, Aldershot.

DEATHS.

BEATTIE.—On April 28th, at Maiduguri, W. Africa, John Abernethy Beattie, M.D., of the West African Medical Staff, aged 27 years.

CHAPMAN.—On May 13th, killed in action in France, Lieutenant G. M. Chapman, M.B. Cantab., R.A.M.C.

GORDON.—On May 20th, at Calcutta, of heart failure, Reginald Gordon, M.B., Ch.B., Surgeon, s.s. *Nankin*, aged 38 years.

PAYNE.—On May 21st, at 76, Onslow-gardens, South Kensington, S.W., Surgeon-General Arthur James Payne, M.D., I.M.S. (retired), in his 89th year.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, LIMITED, London.
The Arcana of Freemasonry. By Albert Churchward, M.D., M.R.C.P., F.G.S., P.M., P.Z., 30°. Price 7s. 6d. net.

ARNOLD, EDWARD, London.
Eye-Witness's Narrative of the War: From the Marne to Neuve Chapelle. Price 1s. net.

CASSELL AND CO., LIMITED, London, New York, Toronto, and Melbourne.
Materia Medica and Therapeutics. By J. Mitchell Bruce and Walter J. Dilling. Tenth edition. Revised to correspond with the British Pharmacopœia, 1914. Price 6s. 6d. net.

KING, P. S., AND SON, London.
The Nature and Purpose of the Measurement of Social Phenomena. By A. L. Bowley, Sc.D. Price 3s. 6d. net.

LEWIS, H. K., London.
Occupational Affections of the Skin: A Brief Account of the Trade Processes and Agents which Give Rise to Them. By R. Prosser White, M.D. Edin., M.R.C.S. Lond. Price 7s. 6d. net.

ROUTLEDGE, GEORGE, AND SONS, London.
Towards Racial Health: A Handbook for Parents, Teachers, and Social Workers on the Training of Boys and Girls. By Norah H. March, B.Sc., M.R.San.I. With a Foreword by J. Arthur Thomson, M.A., LL.D., Professor of Natural History in the University of Aberdeen. Price 3s. 6d. net.

SAUNDERS, W. B., COMPANY, London.
Medical Electricity, Röntgen Rays, and Radium. By Sinclair Tousey, A.M., M.D., Consulting Surgeon to St. Bartholomew's Clinic, New York City. Second edition, thoroughly revised and greatly enlarged. Price 35s. net.
Infection, Immunity, and Specific Therapy. By John A. Kolmer, M.D., Instructor in Experimental Pathology, University of Pennsylvania. Price 25s. net.

Notes, Short Comments, and Answers to Correspondents.

PATENT MEDICINES.

THE Commissioners of Customs and Excise in their latest report give the subjoined particulars respecting the number of licences issued to makers or vendors of patent medicines in England and Scotland and the amount of duty collected (the duty, it is pointed out, does not extend to Ireland).

Year ended March 31st.	England.		Scotland.		Total.	
	No.	Amount.	No.	Amount.	No.	Amount.
1905 ...	36,999	£9248	3130	£782	40,129	£10,030
1906 ...	37,568	9392	3166	792	40,734	10,184
1907 ...	38,166	9544	3187	798	41,353	10,342
1908 ...	39,023	9757	3249	813	42,272	10,570
1909 ...	39,262	9815	3301	825	42,563	10,640
1910 ...	39,113	9777	3300	827	42,413	10,604
1911 ...	39,430	9856	3267	817	42,697	10,673
1912 ...	39,848	9961	3283	820	43,131	10,781
1913 ...	39,849	9963	3269	817	43,118	10,780
1914 ...	39,914	9980	3242	811	43,156	10,791

The net receipts for medicine stamp duty are shown in a separate table as follows:—

Year ended Jan. 31st.	England.	Scotland.	Total.
1905	£329,171	£2,268	£331,439
1906	321,543	2,569	324,112
1907	324,180	2,926	327,106
1908	330,735	3,407	334,142
1909	312,204	3,285	315,489
1910	310,203	2,911	313,114
1911	322,696	2,950	325,646
1912	324,861	2,996	327,857
1913	325,420	2,899	328,319
1914	357,570	2,807	360,377

It should be explained that the licence duty payable by makers or vendors of patent medicine is in Great Britain 5s. per annum, and that the duty payable on medicine labels is 1½d., 3d., 6d., 1s., 2s., or 3s., according to the price of the medicine.

HEALTH AND SANITATION IN THE EAST AFRICA PROTECTORATE.

THE report on the East Africa Protectorate for the year 1913-14 has been received at the Colonial Office and presented to both Houses of Parliament. In the section of the report dealing with medical matters it is mentioned that "if it were not for the disastrous effects of the epidemic diseases which so seriously affected the Protectorate during the year it could be said that a better standard of health was maintained than has yet been recorded. The grand total of those who presented themselves for treatment in 1913 was 108,520 as against 93,408 in 1912. The predominating diseases, affecting all zones in almost equal proportions, were diseases of the digestive, respiratory, and locomotory organs, and affections of the skin. Of the more preventable diseases malaria easily comes first, very few parts of the country escaping this infection. Dysentery also is generally prevalent. Antityphoid inoculation has been inaugurated." Then follow details, of which we subjoin a summary:—

Coast zone.—The number of cases of malaria treated was less than in the previous year, the decrease being to a great extent due to the spread of knowledge and an extended use of quinine. There were 11 cases of blackwater fever, and 1 case of trypanosomiasis, the subject being a derelict native brought in by the police, of whom no history could be obtained. There is a large field for research in the study of elephantiasis, as cases are common, though rarely presenting themselves for treatment. There were 208 cases of plague (as compared with 27 in the previous year), with a death-rate of 88·46 per cent., the vast majority of cases occurring in Mombasa. The type was largely bubonic, with a serious proportion of pneumonic cases. Small-pox

occurred at infrequent intervals. The number of cases of dysentery increased considerably, the chief sufferers being imported labourers from Kikiyu and Kavirondo. There were 28 cases of beri-beri, the patients being all from up country. There were 4 cases of enteric fever (all Europeans), none of which proved fatal. There were sporadic cases of cerebro-spinal meningitis. The improvement in general conditions of health of the European population was satisfactorily maintained; malaria was the principal cause of sickness.

Mountainous area.—The health of both Europeans and natives was more satisfactory than in the previous year. There was an appreciable decrease in the number of cases of malaria; the type was largely subtertian. There were 3 cases of blackwater fever, 1 of which proved fatal. There were 25 cases of plague at Nairobi, with 19 deaths, and 31 cases at Kisumu, with a mortality of 87 per cent. 63 cases of small-pox were recorded, of which 12 were fatal. A severe outbreak of dysentery occurred amongst the labourers employed on the construction of the Eldoret-Londiani road. The total number of cases throughout the zone was 777, as against 612 in 1912. There were 21 cases of enteric fever, 1 of which proved fatal. The number of cases of cerebro-spinal meningitis reported was 288, with 152 deaths. The rains were early and prolonged, and it was during these cooler months that the epidemic was more apparent. Amongst the European population the most noticeable feature during the year was the large number of children's diseases, chiefly cases of intestinal trouble.

Kenya and Nyanza Provinces.—During the wetter and colder months rheumatic affections prevailed very largely in the neighbourhood of Mount Kenya. 3627 cases of malaria were recorded, as against 3134 in 1912. Some of the native chiefs in the Kenya Province have taken to sleeping under mosquito nets. One case of blackwater fever was reported. One imported case of sleeping sickness was discovered at Kisii, 30 or 40 miles from the lake shore, but notifications of the occurrence of this disease are yearly getting rarer. The epidemic of cerebro-spinal meningitis which broke out in May was the most disastrous experienced in the Kenya Province since the advent of European occupation. So severe was it that at one time it threatened to paralyse the interior economy of the province. It is quite impossible to estimate the number of cases, but it is probable that the normal sick-rate among the native population was more than doubled. The death-rate is estimated at from 3 to 10 per cent. above the normal. The infection did not reach the Nyanza Province till the latter part of the year. 31 cases of plague occurred at Kisumu, with a mortality of 87 per cent. There were 15 cases of enteric fever, with 3 deaths. For the first time on record no cases of small-pox were reported in the Nyanza Province, but desultory cases were met with in the Kenya Province.

Desert zone.—There were several cases of conjunctivitis and corneal ulcers, probably due to glare, sand, and flies. The predominating cause of sickness was malaria, 445 cases being notified in Kismayu alone. Dysentery was common in Jubaland, owing to the dependence of the population on the muddy waters of the Juba River and polluted wells. There were 2 cases of beri-beri and cerebro-spinal meningitis appeared in two instances. The general standard of health of Europeans in these regions has always been good, and this year was no exception; only 1 case of malaria was recorded.

Vaccination.—During the year 131,757 vaccinations were performed. The lymph used was prepared at the Government laboratory, and the quantity issued was 376,202 doses.

Sanitation and preventive measures.—The Sanitation Division of the Administration was created on April 1st, 1913, under a chief sanitation officer. In June Professor W. J. Simpson, C.M.G., professor of hygiene at King's College, London, arrived to inquire into the sanitary conditions of the Protectorate. Energetic measures are being carried out against mosquitoes by gangs maintained at Mombasa, Nairobi, and Kisumu. The measures adopted to suppress the outbreak of plague at Mombasa were house-to-house visitation, fumigation, segregation, inspection of travellers, and inoculation with Haffkine's prophylactic in 48,478 instances. Similar steps were taken in other parts of the Protectorate. No water-borne sewage scheme has yet been installed, but in a few isolated cases septic tanks have been added to residences. The single-bucket system is in vogue generally. The contents of the buckets are thrown into the sea at Mombasa, and buried in trenches at Nairobi, Kisumu, and other towns. Except in Nairobi, where the Bransby-Williams scheme is now well in hand, no township possesses a drainage scheme of a kind that can be regarded as satisfactory. At Mombasa and in the scattered residential districts the need is not acute owing to the absorbent nature of the soil, but in the more densely populated areas the question is of more importance. A large amount of the work performed by antimosquito gangs is caused by the absence of adequate provision for the removal of waste water. It must now be accepted that all African rivers are more or less polluted, and general filtration, &c., is most necessary before water can be considered fit to drink. The Mombasa service will not be completed for some time. Similar services are being taken in hand for Nakuru and Kisumu. Considerable work has been done during the year in bush cutting and in digging out roots. The alterations in the general appearance of certain areas in Mombasa, Nairobi, and Kisumu are very much for the better. The southern part of Mombasa is now clear of bush.

RHUBARB POISONING.

To the Editor of THE LANCET.

SIR,—In your issues of May 8th and 22nd I note letters from "M.D." and "M. L. J." relating illnesses apparently due to eating rhubarb. I should like to say that about two months ago I had a similar experience after partaking of rhubarb for lunch. Two or three hours afterwards I was seized with colicky pains in the abdomen, which gradually increased in intensity, and were shortly afterwards succeeded by rise of temperature, quick pulse, vomiting, and purging. I felt violently ill for a few hours; then the symptoms gradually subsided, and, unlike your correspondents, were not succeeded by any renal or vesical trouble. I should add that a lady of my acquaintance was made similarly ill just previously after partaking of stewed rhubarb at a meal. The symptoms may be attributed to the poisonous effects of the oxalic acid in rhubarb.

I am, Sir, yours faithfully,

May 25th, 1915. M.B.

THE DANCES OF GREAT BRITAIN AND HER ALLIES.

A RECITAL of patriotic dances will take place at 5.30 P.M. on Thursday next, June 3rd, the birthday of His Majesty King George V., at the Fyvie Hall of the Regent-street Polytechnic, Regent-street, London, W. The children taking part will be relatives of airmen, soldiers, or sailors, and the proceeds of the recitals will be devoted to the expenses of the wards for nursing wounded soldiers at the Heritage Craft Schools, Chailey, Sussex (Princess Louise Military Wards). Those who attend the recital are invited to bring gifts for the troops with them, such as handkerchiefs, socks, shirts, tobacco, cigarettes, sweets, gramophone records, books, and magazines; sheets, single or in pairs, will also be most acceptable. Tickets, price 5*s.*, children 2*s.* 6*d.*, can be obtained from Mrs. C. W. Kimmins, The Old Heritage, Chailey, Sussex.

There will be another performance at 7 on the same day and at the same place in aid of the same object. For tickets, price 2*s.* and 1*s.* 6*d.*, application should be made to Mrs. Matthews, Glenkindie, Drewstead-road, Streatham, S.W.; Miss Graham, 38, Mecklenburgh-square, W.C.; Miss Kingston, 71, Corringham-road, Golder's Green, N.W.; or Miss Simmons, 8, Worple-avenue, Wimbledon, S.W. A stamped addressed envelope should be enclosed.

PERMANENT DISCOLOURATION OF THE SKIN.

C. W. (Wolverton, Bucks) writes as follows: "A man aged 53 had an attack of gout during the severe weather in January and February this year. With the gout he also had an attack of eczema. The penis, scrotum, anus, and calves of the legs were attacked by the eczema. In a month both gout and eczema were cured. The skin of the penis and scrotum is now normal, but that of the nates and the calves of the legs is of a dirty-brown colour. The patient has consulted several medical men with regard to this colour, and they have no suggestion to make. It was thought that in time the skin would become normal. Could any of your readers suggest a remedy to clear the skin on these parts? If the patient goes to the sea or the baths it is very inconvenient to have such patches of dirty skin visible! Is there *no* remedy?"

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

METEOROLOGICAL READINGS.

(Taken daily at 9.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 26th, 1915.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
May 20	30·020	S.	...	80	61	49	52	54	Raining
,, 21	30·020	S.	...	112	71	54	57	60	Cloudy
,, 22	30·070	N.E.	...	118	68	56	58	59	Cloudy
,, 23	30·180	N.E.	...	119	74	52	55	60	Fine
,, 24	30·210	E.	...	121	76	51	53	58	Fine
,, 25	30·130	N.E.	...	121	78	47	53	56	Fine
,, 26	29·934	N.E.	...	121	80	54	56	63	Fine

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.
THURSDAY.—Papers:—Mr. E. J. Russell: Soil Protozoa and Soil Bacteria (communicated by Mr. H. T. Brown).—Mr. C. Dobell and Mr. A. P. Jameson: The Chromosome Cycle in Coccidia and Gregarines (communicated by Prof. J. B. Farmer).—Prof. O. W. Richardson: The Influence of Gases on the Emission of Electrons and Ions from Hot Metals.—Prof. C. H. Lees: On the Shapes of the Equipotential Surfaces in the Air near Long Buildings or Walls, and on their Effect on the Measurement of Atmospheric Potential Gradients.—Mr. J. W. Nicholson: The Band Spectrum associated with Helium (communicated by Prof. A. Fowler).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY.
SECTION OF ODONTOLOGY (Hon. Secretaries—F. Coleman, F. R. Smyth): at 8 P.M.
Annual General Meeting.—Election of Officers and Council for Session 1915-1916.
Casual Communication:
Mr. J. G. Turner: A Note on Extraction.
Paper:
Mr. F. J. Bennett: Recent Studies in Calcification of the Teeth.
THURSDAY.
SECTION OF DERMATOLOGY (Hon. Secretaries—S. E. Dore, A. M. H. Gray): at 5 P.M.
Adjourned Meeting.
Debate on the Pemphigoid Eruptions.
FRIDAY.
SECTION OF EPIDEMIOLOGY AND STATE MEDICINE (Hon. Secretaries—G. S. Buchanan, William Butler): at 8.30 P.M.
Paper:
Mr. Major Greenwood, jun., and Mr. G. Udny Yule: Anti-typhoid and Anti-cholera Inoculation: a Statistical Study.
WEDNESDAY (June 9th).
SECTION OF OPHTHALMOLOGY (Hon. Secretaries—Leslie Paton, Elmore W. Brewerton).
Cases (at 8 P.M.)
Paper (at 8.30 P.M.):
Mr. Fisher: Retinitis in Pregnancy.

NORTH-EAST LONDON CLINICAL SOCIETY, Prince of Wales's Hospital, Tottenham, N.
THURSDAY.—4.15 P.M., Election of Officers, 1915-1916. Clinical Meeting.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, Society's Rooms, West London Hospital, Hammersmith-road, W.
FRIDAY.—8 P.M., Cases. 8.30 P.M., Paper:—Dr. F. S. Palmer: The Functional Palsies and their Recognition.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—10 A.M., Dr. Simson: Diseases of Women. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. D. Armour: Operations. Dr. Pritchard: Bacterial Therapy Department. Mr. B. Harman and Mr. Gibb: Diseases of the Eye.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women. Mr. Gibb: Diseases of the Eye.
THURSDAY.—9 A.M., Dr. Bernstein: Bacterial Therapy Department. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. D. Armour: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. H. D. Gillies). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting). 4.30 P.M., Clinical Demonstration:—Mr. J. Howell Evans: Selected Surgical Cases.
WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. Gillies). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients. 5.30 P.M., Eye Operations (Mr. R. P. Brooks).
THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.
MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M. Clinical Lecture.

KING'S COLLEGE (UNIVERSITY OF LONDON), Physiological Laboratory, King's College, Strand, W.C.
Course of Advanced Lectures in Physiology:—
MONDAY AND WEDNESDAY.—4.30 P.M., Prof. T. G. Brodie: The Gases of the Blood. (Lectures I. and II.)

For further particulars of the above Lectures, &c., see Advertisement Pages.

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